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The Indian Empire as a Market for Canadian Products

BY

H. R. POUSSETTE

Director, Commercial Intelligence Service

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DEPARTMENT OF TRADE AND COMMERCE
OTTAWA, CANADA

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COMMERCIAL INTELLIGENCE SERVICE
H. R. POUSSETTE, Director

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DEPARTMENT OF TRADE AND COMMERCE
X COMMERCIAL INTELLIGENCE SERVICE X
OTTAWA, CANADA

1922

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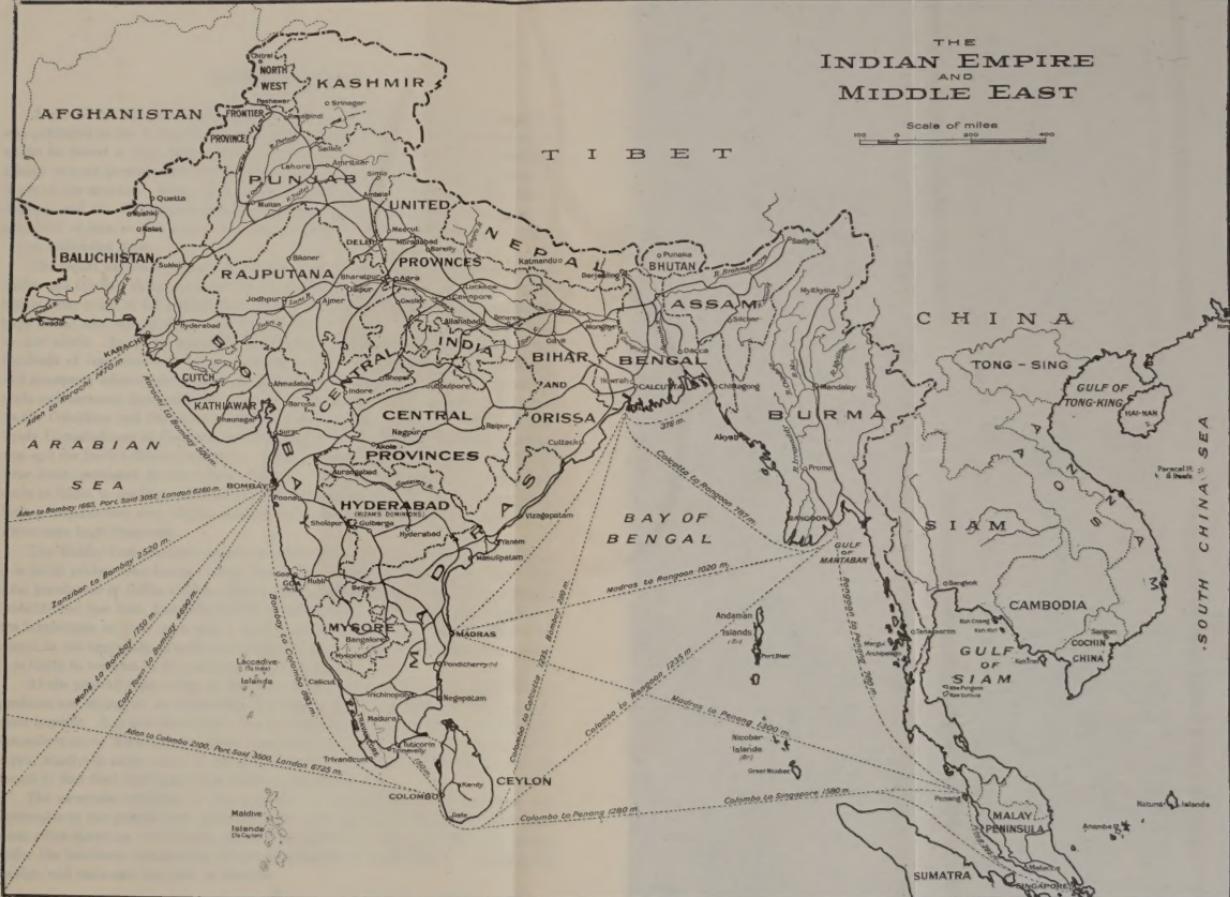
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THE
INDIAN EMPIRE
AND
MIDDLE EAST

Scale of miles



INTRODUCTION

A portion of the following report—that is, the sections dealing with imports—was published in the spring of 1921, and it was then hoped that the completed report might be issued a little later. It was found, however, that the work incidental to taking over my present office, and a certain amount of consequent reorganization, put it out of the question. It was also intended to deal fully in this report with Ceylon, Malaya, and the Netherlands East Indies; but the demands on my time have not permitted of this, so that rather than delay it longer, it is being issued in its present rather unfinished state.

The report has been prepared as the result of a tour made through Malaya, Java, India, and Ceylon, which extended over the greater part of 1920, and embraced practically every point of importance from Karachi on the eastern side of India to Soerabaya at the west end of Java; and from Colombo in the south to the Khyber Pass in the north. In it is embodied the information drawn from conversations with hundreds of importers and many government, railway, shipping and bank officials, and newspaper editors; from personal observation, and from the perusal of numerous trade and economic text books and a number of excellent reports, including the *Report on the Condition and Prospects of British Trade in India*, prepared by H.M. Senior Trade Commissioner at Calcutta, and the reports of the Indian Industrial Commission and the Indian Stores Committee. Much data has been selected from the *Indian Year Book*, published by the *Times of India*. To ensure accuracy, every effort was made in India to confirm verbal statements, and that part of the report dealing with Indian imports was very kindly checked by most competent men, the majority of whom were large importers.

The Middle East promises important markets for many Canadian products; but it is fairly evident that few in Canada have a full conception of its possibilities. The total population of India, Ceylon, Malaya, Siam, and the Netherlands East Indies is probably not less than from 375,000,000 to 400,000,000. True, the vast majority of the inhabitants are very poor, with a small purchasing power, but even so, 400,000,000 people in the aggregate, directly and indirectly, have a large consuming power. And it is likely to increase in the ordinary course of events.

At the present time, owing to the heavy falling off in European demand, Indian products are selling at an abnormally low figure, which naturally reacts seriously upon imports. But this phenomenon has occurred before, and conditions should right themselves at no distant date. Such commodities as cotton, jute, tea, hides, rubber, copra, sugar—to name some of the principal—are all staples of commerce, and are bound to find their legitimate level within a reasonable time.

The economic condition of the countries of the Middle East is anything but favourable at the present time, and they suffer with the rest of the world. India and most other countries over-bought and over-speculated in 1919 and 1920, and to-day suffer the inevitable consequence of not anticipating or being able to anticipate the sudden and universal cessation of demand.

In February of 1920 the Indian rupee rose to 2s. 10d., and by December of the same year had fallen to below 1s. 4d. The effect of this was disastrous. Orders abroad were given when the purchasing power of the rupee was high, and payment had to be made when it was low. But it is unnecessary to follow this phase of the situation; it is all too familiar to business men in every quarter of the globe. The report is not designed to deal with present conditions so much as to arouse, if it be so fortunate, among Canadian exporters, the interest which the Middle East merits, so that they may be persuaded at least to investigate it as a field for future enterprise.

There is no desire to discuss political questions in a report of this kind; nevertheless, since political unrest must react unfavourably on the economic condition of India, a few words may not be out of place. A great deal has been heard about the frenzied attempts of Indian political agitators to bring about a feeling of actual hostility toward British rule in the apparent hope that it may bring about separation. It is evident that the blind fanaticism of the Hindu agitators has prevented them from foreseeing the result which a successful issue of their efforts would entail. But it does not take even the tourist long to realize it. Chaos, and chaos of the most hideous kind, would result, and that speedily. One speculates in India as to the effect upon the country if the power of the British Raj were withdrawn, and how long it would be before the Hindus of the plains began to implore his return. The Moplah outbreak amply illustrates this. Britain stands for progress. The present-day agitators stand for reaction. In this they are no more opposing Britain than they are the United States or France, or any other progressive and enlightened country. Fundamentally, they are opposed more to the spirit of the Western Hemisphere than they are to anything in the Eastern.

Canadians have an interest in these conditions, otherwise no reference would be made to them. Mistakes have been made, of course, and we are all wiser after the event, but if it has done nothing else, British rule has brought justice, and the enjoyment of the fruits of their labour to the formerly down-trodden and oppressed. The country has now reached a state of prosperity that would never have been possible had it not fallen under the rule of a strong, tolerant and just Power. It is only by the continuation of this rule that India can remain an ordered and valuable market for the manufactured products of the world.

It is highly desirable that those attempting to deal with India should understand something of its conditions. And for this it is essential that it be approached without set or preconceived notions. "East is East and West is West"; and probably in no other part of the world where they meet are the two viewpoints more divergent. India is the antithesis of a democratic country. It cannot be otherwise; for it is the home of caste. The Indian system of caste is peculiar. In the first place, it is connected with religion. The Indian word denoting it is *Varna*, meaning colour; but the word *caste* is derived from the Portuguese *casta*, signifying breed or race. According to the Institutes of Menu, Brahma created four castes: the Brahmin or priestly class, which also included the learned professions; the Kashatriya or warrior and rajah class; the Vaisya or commercial and farmer class; and the Sudras or servile class. The Sudras were commanded to serve the other three castes. These four castes were further subdivided into sixty-four, but the numbers have been con-

stantly added to until now they are innumerable. And added to these are the outcasts or untouchables, the lowest of the low in the eyes of the Brahmin. It is almost impossible, or at least extremely difficult, for Canadians to visualize a society founded on such a system. It can be readily apprehended that caste restrains the lower strata of society from improving its condition, for a man being born in a caste lives in it, dies in it, and his sons and sons' sons after him. Hence there is no incentive to rise in life, the dominating motive of the Western. Since the high-caste Hindu considers himself defiled by contact with one of low caste, it will easily be appreciated that it is absolutely impossible to make the races of India homogeneous. True, caste does ensure the continuation of hereditary craft and the retention of skilled trade secrets, and in a manner it has somewhat the influence of a guild, but from the Western point of view its advantages are more than nullified by its strangling effect on individual effort and aspiration.

Another influence that tends to check individual effort is the Indian conception of family. According to one Indian economist, "No member of a joint family can enjoy or bequeath to his children the entire fruits of his labour; as the few bread-winners of the family feed all its members, the drones are not roused from their laziness. Thus necessity does not call forth the energy of every man in India. No accumulation of large capital in one hand is possible in India, because a man's earnings are distributed amongst his kinsmen, hence rich individual firms cannot last longer than one generation."

Perhaps the most radical difference between the West and India is in the conception of man's relationship to the world. The West affirms that life is important, that a man's daily avocation, his social activities, his ambition to improve his state, may, if rightly directed, be very beneficial in the building up of character. The teaching of the West is to live and to enjoy life in its fullness, to delight in labour, and to expect to enjoy the fruits of labour. The West largely believes that man creates his own destiny, except in so far as he is hampered by the action of heredity, environment, and similar influences. The Indian, on the other hand, is a fatalist. His religion does not encourage him to dominate life, but to escape from it. Life to him is an illusion—in fact a terrible illusion, not a reality; and to escape from it is the keynote of his religion. But owing to the circumstances in which he is placed, the high-class Indian of to-day is born to one set of ideas and educated to another; is born to despise the material things of the world and educated to prize them. Is it any wonder there is ferment? We are told that India is in a state of transition; it cannot be otherwise, nor can it escape a state of ferment, with two strong opposing mental forces striving for the mastery. There seems little doubt that the influence of the West will to a larger degree in the future than it has in the past exert a modifying influence upon Indian thought and customs. If India is to progress, it can hardly be otherwise.

When one contemplates the 315,000,000 inhabitants of India or the 375,000,000 to 400,000,000 of the Middle East and their purchasing power, small as it may be individually, one is led to speculate on the immense expansion which would result if the earning power of the masses were only slightly increased. At five cents *per capita*—not an extravagant amount surely—this would give an increased purchasing power

of 20,000,000 dollars per day. There are those who expect this for the 400,000,000 workers of China, yet China has a weak administration, whereas India is firmly and wisely governed.

That there is plenty of potential ability in the Indian is evidenced by the record of the large number of those who have the advantages of education, culture, and birth. Canadians do not as a rule hear much about the Indian people other than the princes and rajahs, but a closer association with the country shows a considerable amount of talent and ability, and there is little reason to doubt that with opportunity this would become apparent. While India has had a civilization for many centuries, it made little advancement, as advancement is understood by the Western, until the advent of the British. Since then, and particularly during the present century, India has made wonderful strides, assisted by British capital, British brains, and British justice. Without these the country would probably have lacked to a large extent her fine railway system, the development of her ports, and the very important and highly profitable industries of cotton, jute, tea, leather, etc., which have done so much to bring prosperity in their wake.

The history of Indian commerce extends over very many centuries to before the Christian era. One interesting point about it is that its tendency has always been toward countries to the West. In the very early days the commercial routes were overland. At first commerce was confined to neighbouring peoples, but it gradually extended afield by way of the Oxus and the Hindukush rivers. Some centuries prior to the Christian era a new route was opened, part of it by sea and part overland. By this route vessels carried the commodities of India to the head of the Persian gulf, and from there they were transported by caravan through Mesopotamia to the Mediterranean sea and eventually found their way to Europe. Science played its part; for the discovery of the action of the trade winds had an important bearing on Indian commerce, and was doubtless influential in promoting trade to the East with such far-away countries as China.

In the early days India exported cotton goods, particularly the beautiful Dacca muslins, spices, and precious stones, and took in payment precious and other metals, and cloth. The Indian has always shown an extraordinary desire for gold and silver, and it is recorded that the historian Pliny complained that India was absorbing too much gold.

The adventurous voyage of the Portuguese navigator, Vasco da Gama, was of the highest importance to the countries of the Middle East, and more especially to India. The discovery of the passage round the Cape of Good Hope in 1498 opened a much more advantageous route for Indian commerce to the West than that traversing the Arabian sea, the Persian gulf, and the plains of Mesopotamia. The Portuguese were followed by the Dutch, who in turn were crowded out by the British.

An event of importance occurred in the beginning of the seventeenth century, when the East India Company obtained its charter. Any one at all familiar with the history of India is also familiar with this famous company, which did so much to build up British power in the East. After the discovery of the route around the Cape of Good Hope, probably the next most important event affecting India was the opening of the Suez canal in 1869. This great enterprise had the immediate effect of reducing the voyage to India from one hundred days via the Cape to twenty-five days via Suez.

With this immense advantage, and the opening up of railways, Indian commerce took an impetus which has never ceased, and which should not cease unless the peaceful progress of the country be interrupted by political disturbance.

Canada has a most favourable opportunity in the Middle East at the present time. Paradoxical as it may seem, the very misfortunes from which these countries are suffering can to a certain extent be turned to advantage. To open up business relations at a time of great prosperity may, as experience has shown, lead to considerable losses: witness the experiences of 1919 and the first half of 1920, when almost the only thing that mattered in connection with firms was whether they were able to secure supplies or not. Their solvency was hardly ever questioned. It is a very different proposition to open up relations when a country has sunk almost to the lowest depths of commercial depression, as it should be fairly certain that any firms that survive the present crisis may be considered so firmly established as to warrant a very considerable measure of confidence. This fact confers a distinct advantage on the new entrants into the Indian field.

Canadians embarking on trade with India will probably be well advised to confine their operations to the large European importing houses. The native houses, speaking generally, are not considered sufficiently reliable. In days of prosperity, dealings with them should occasion no anxiety. In times of falling prices, however, it is rather the reverse. In the West, a merchant who fails to meet his bills may be considered dishonourable, but this is not the usual point of view of the average Indian. His attitude is different; with him the meeting of his obligations is often more a matter of convenience than a point of honour.

To observe the Indian merchant in his place of business would generally give the stranger an entirely misleading impression. He may be seen sitting cross-legged in a tiny room in the bazar, looking perhaps soiled, and with not a single mark, appointment or convenience which in the West is associated with the successful business man; and yet one may be told, as one goes about with a *shroff* or a *banya*, that he is worth several lacs of rupees; he may indeed be a direct importer with a large turnover. When depression sets in it is said these merchants sometimes disappear if involved, or the business may be made over conveniently to a relation. It will be gathered from the above that caution is necessary, and it is better for Canadians to confine themselves to European houses, or only to those Indian firms who possess the most unassailable references and an untarnished record; and of course there are a number of such.

While a certain amount of business can be effected at long range, it may be taken as a principle that Canadian firms who are determined to investigate and exploit the Indian market must send representatives to study it on the spot, to demonstrate their goods, and to make connections. One sees from time to time advices from Canadian importers to British manufacturers, advising the former that if they wish to compete with the United States, they should send a capable representative to Canada. The same applies to India; and Canadian manufacturers will receive identically the same advice from Indian importers. The question of representation is dealt with elsewhere.

The first thing for an exporter interested in the Indian market is to study the Indian trade returns, or to apply to the Department of Trade and Commerce, Ottawa,

for advice, in order to ascertain if there is a market for his product. But once satisfied that the markets of the Middle East hold opportunities for him, he should be prepared to send out a suitable representative, and to take any other steps deemed necessary to build up a profitable trade.

In conclusion, the opportunity is taken here to acknowledge indebtedness for much valuable information obtained from many Government and other officials, and from merchants met in the course of my tour; also from books on economics and reports of various kinds, to which reference has already been made.

H. R. POUSETTE.

OTTAWA, December, 1921.

THE INDIAN EMPIRE AS A MARKET FOR CANADIAN PRODUCTS

Currency, Weights and Measures

COINAGE

The nominal value of the rupee is now 2 shillings or one-tenth the gold content of a sovereign. Its actual value is between 1s. 4d. and 1s. 5d.; about a year ago it was 2s. 10d. (see Chapter VII, section on Indian Economics). A lac of rupees is one hundred thousand, written 1,00,000; a crore equals one hundred lacs, written 1,00,00,000. In India proper the rupee is divided into 16 annas, the annas into 4 pice, the pice into 3 pies. In Ceylon the rupee is divided decimaly. In Canadian funds, par value, one rupee equals \$0.324. The anna equals \$0.02. The pice equals \$0.0048. The pie equals \$0.0016.

WEIGHTS

The scale of weights is generally uniform, but the actual weight of the unit varies greatly. The scale in general use is as follows:—

One maund— 4 seers.

One seer—16 chittaks, or 80 tolas.

The actual weight of a seer varies from district to district, but in the standard system used in official reports the tola is 180 grains troy (the exact weight of a rupee). Thus the seer weighs 2.057 lbs. and the maund 82.28 lbs.

In calculating retail prices in India, the universal custom is to express them in seers to the rupee. Thus when prices change, what varies is not the amount of money to be paid for the same quantity, but the quantity to be obtained for the same amount of money.

THE INDIAN EMPIRE AS A MARKET FOR CANADIAN PRODUCTS

CHAPTER I

Peoples and Provinces

The realization that his preconceived ideas of India were but very imperfect is impressed upon the traveller when for the first time he is brought into direct contact with that age-old land of legend and romance. It is indeed only by actual contact that its size, its diversity, and its infinite complexity are fully appreciated.

The total area of the Indian Empire is approximately 1,773,168 square miles. Of this 1,097,901 square miles are directly under British Administration, and 675,267 square miles are divided between some six or seven hundred native states, all in varying degree under the British Raj. These native territories vary in size in the most striking way, from small states of about 20 square miles to large and powerful states, such as Kashmir, which is the largest in area, possessing over 84,000 square miles of territory and 3,000,000 inhabitants, or Hyderabad, first in wealth and population, with approximately 82,000 square miles and over 13,000,000 inhabitants.

PROVINCES, FOREIGN POSSESSIONS AND NATIVE STATES

India is divided into provinces of varying areas, each of which is termed a local government. These include the three presidencies of Bengal, Madras and Bombay, and the provinces of the Punjab, Bihar and Orissa, Central Provinces, United Provinces, Burma, Assam and the Northwest Frontier Province. There are minor administrations such as Delhi, Baluchistan, Coorg, Ajmer-Merwara and the Andaman Islands. The most populous is the United Provinces, which contained in 1911 over 47,000,000 inhabitants. Bengal, Madras, Bihar and Orissa, and the Bombay Presidency are also thickly populated, containing respectively 45,000,000, 41,000,000, 34,000,000 and 19,000,000 inhabitants.

It is not unfrequently forgotten that both the French and Portuguese hold possessions in various parts of the peninsula, the administration of each being in the hands of a governor. The traveller is taken almost unawares when he is brought into such a possession as that of Chandarnagar, situated twenty-two miles above Calcutta on the Hooghly river. This tiny fragment of her colonial empire is just as much French as France itself. In addition to Chandarnagar, France also owns Pondicherry, which is the headquarters of the French administration. It is situated about one hundred miles south of Madras on the bay of Bengal. Altogether the five French possessions are a little over 200 square miles in area, and contain a population of about 300,000. These possessions changed hands many times during the conflicts between the French and the British in the eighteenth century, but were finally assigned to France after the Battle of Waterloo.

The Portuguese have held possessions in India since the first years of the sixteenth century, when their power was paramount in Eastern waters. In those days, Goa was an important centre, but with the decline of Portuguese influence in Europe their power in the East waned proportionately, and now only some three or four little possessions remain as relics of their former greatness. Goa is the principal of these. It is situated on the Malabar Coast within the limits of the Bombay Presidency and contains a population of about 500,000. There are also the little island of Diu, the

territory of Daman, with the small territory of Nagar-Avely at the entrance to the Gulf of Cambay to the north of Bombay on the Arabian Sea, the village of Gogla, and the fort of Simbor, situated at the southern extremity of the Kathiawar Peninsula.

The number of the native states is a typical surprise for the traveller in India. In a vague way, picturesque ideas of native princes belong to nearly every one's conception of the country, but few probably have appreciated the large number of these princes and rajahs and maharajahs with their native states, scattered from one end of the Peninsula to the other. Consequently the highly complicated system as well as the ability and local knowledge required to administer or control all of these states, can be well imagined. For example four or five of the principal states have direct relationship with the Government of India, some 170 to 180 are controlled by the Central Government, and about 500 more by the various local governments. The system employed appears to have been evolved on a satisfactory basis, which makes for harmony; the states obtain security, while the British Crown gains control.



General Post Office, Bombay.

India's vital statistics present yet another example of its complexity. According to the census of 1911 the total population numbered 315,000,000. Some 245,000,000 are directly under British rule, while 70,000,000 reside in Native States. This immense population is made up of a heterogeneous mass of peoples of various nationalities, various languages, and entirely distinct modes of thought and living. An impassable gulf separates the Hindu from the Mohammedan; the Ghurka is entirely distinct from the Sikh; the Sikh from the Pathan; and the Pathan from the Burman. One reads a great deal in these days of the unity of the Indian people in their agitation for self-government; but no real unity can exist among a vast and variegated mass of peoples speaking no fewer than 150 different languages and dialects, and practising each their peculiar religion, such as those of the Hindu, Mohammedan, Budhist, Jain, Sikh and Christian; and moreover in many cases very cordially detesting or despising one another.

POPULATION

The population of India increases very rapidly, and if it were not for periodic visitations of famine and disease, would probably in a comparatively short time expand beyond the ability of the country to sustain it. As an indication of this rapid rise it should be noted that in 1872 there were 216,000,000 inhabitants; in 1911, 315,000,000. The population of some of the chief cities, as given at the last census:—

	1911
*Calcutta...	1,222,313
Bombay...	979,445
Madras...	518,660
Rangoon...	293,316
Karachi...	151,903

*Including Howrah.

In 1917 the birth-rate was 32.72 per thousand. Such a ratio, if applied to 315,000,000, would result in an enormous annual increment to the population. But, as has been stated, the increase is much curtailed by the ravages of disease. In 1917, fevers accounted for 4,555,000 deaths; plague, 437,000; cholera, 267,000; dysentery and diarrhoea, 261,000; respiratory diseases, 367,000.

In India there is an average of 175 persons to the square mile, taking the country as a whole. In the native states this average is reduced to 100; but in the territories solely under British control, it amounts to 223, and in some parts to as much as 500 to the square mile.

PLAUE

While every effort is made by the Government to mitigate the disastrous effects of famine and disease in India, the problem presents tremendous difficulties because of the habits of thought and manner of life of the population. The vast majority of the people are more or less fatalists, and the Hindu objection to destroying life of any kind makes it practically impossible to carry out any effective measures for the stamping out of disease. Bubonic plague is propagated by the rat, which carries on its body the plague-infected flea; but the Hindu refuses to destroy the rat as he does other forms of life. Thus it can be appreciated how difficult it is to eradicate the cause of this very virulent disease. Again, while the Indian himself is on the whole fairly clean in his person, his villages are the very opposite. Indeed modern sanitation in most of the cities and towns is practically unknown. Sanitation as it is understood among Western peoples is only found in such cities as Calcutta and Bombay.

Undoubtedly, many improvements have been accomplished in sanitary conditions from those of say fifty or even twenty-five years ago, but there is still wide room for improvement. Indian houses are ill-ventilated and overcrowded. The village water supply is polluted. In the village itself vegetation grows rank, and it is crowded with cattle that roam where they will. Perhaps in time, when education of the right kind spreads and permeates to the depths of Indian society, a better system, even a modern system, may be introduced. Its introduction can be nothing but a long and slow process of education, requiring infinite patience, tact, and zeal, and it may only accompany peace and prosperity.

FAMINE

In the past, famine has exerted an enormous influence on Indian life. The country has always been largely agricultural, and as the peasants more or less live from hand to mouth, they are unable to set by a store to provide for the lean years. A large proportion of the agricultural labour available is non-permanent and floating,

so that if the Monsoon fails, unemployment follows. The Indian lives by the Monsoon. If the Monsoon is a good one, there is plenty; if it fails there is want, suffering, and probably death on a terrible scale.

Relief measures and the construction of railways have been instrumental in robbing famine of much of its old-time terror. The policy of the government to-day has two aims, the one remedial, and the other preventive. Before the advent of the railways, it was easily possible for millions of people to die in one part of India from starvation, while others in a different area were in possession of plenty. In the latter half of the eighteenth century, one famine in Bengal destroyed not less than 10,000,000 people, and as late as 1878, in spite of the knowledge acquired and the assistance of the railways, 5,250,000 persons died of starvation in British Territories alone.

CHAPTER II

Agricultural Conditions

THE RYOT AND AGRICULTURE

India is in the main an agricultural country. No less than 70 per cent of the population live by the soil. In good seasons, India prospers; in poor ones she languishes. The difference between a good and a bad season, primarily depends upon the rain-bearing Monsoon. The Monsoon is the term applied to the south-west trade wind which may commence any time after April and usually ceases sometime before the middle of November. Whether it be early or late in coming, it can be truly said that all the hopes of India centre upon it.

Indian agriculture is still in an extraordinarily primitive stage. Even just outside Calcutta one can see to-day the Indian peasant employing the same implements and the same methods as were doubtless in common use before the Christian era. There is good reason for this, since until the administration of the country was taken over by the British, the condition of the Indian ryot, as the peasant is called, was indeed pitiable. The country was constantly torn by war and dissension; one dynasty succeeded another, to be in turn itself destroyed. Throughout all this turmoil the rights of the peasant were given small recognition, and there was little hope or expectation that the labourer would reap the fruits of his toil.

There are also other causes which to-day operate to keep agriculture in India in a very primitive condition. Undoubtedly the most powerful of these is poverty. It is stated, with every probable truth, that the ryot lives in what is virtually a state of slavery. Owing to his improvidence he usually falls early into the hands of the banya (the term applied to the village money lender), and as a rule death alone releases him from the grip of that shrewd and grasping person. One of the foolish customs in India is the spending of excessive sums of money upon marriages and funerals. Many of the lower castes incur a life-long obligation in order that they may make an impression in the ceremonies on one or other of these occasions.

Once the ryot has fallen into the hands of the banya, the latter takes good care that he shall never extricate himself. Thereafter the peasant is financed by him. At the commencement of the season he obtains his seed from the banya, and whatever supplies he requires he pays for out of his produce on the completion of the harvest. Extremely high rates of interest are demanded of him, and up to a certain point these are not unjust, as the money is lent without any security or only upon the flimsiest. The result is that the peasant is unable to make improvements since he has not the money to purchase fertilizers or modern implements even when he has the desire, nor is he able to improve his stock or even to feed it adequately.

Of the many vital economic problems with which India is confronted, none perhaps is more insistent than that of improving the output of the land.

GOVERNMENT CO-OPERATION AND SEED SELECTION

The Government of India is endeavouring, by means of co-operation, to assist the peasant, and as far as can be judged, it is meeting with a slow, but nevertheless increasing success. The Government lends money at about the market rate; but apparently these advances to the peasant are made for specific purposes only, such as the purchase of cattle, of selected seed, or of implements. The problem, however, is being constantly studied. Very possibly the loan system will in time become a more powerful aid than at present, when it is better understood by the people and its full value is recognized. A Provincial Director of Agriculture, who has had considerable experience in co-operation, expressed the opinion that in time this would be the means by which the ryot would free himself from his dependence upon the banya. He stated that a villager, joining a co-operative society, pledged himself not to resort to a banya for loans. It is the business of the local committee to see that he lives up to his agreement, since if his loan should be a loss to the society, it would be distributed among its members. They therefore have a very cogent reason for keeping any of their members out of the clutches of local money lenders.

Many people, even in India, maintain that the ryot is opposed to progress because his mind is inhospitable to change. Judging by conversations with many gentlemen who have come into close contact with him, this view is by no means universal. Those who were in a very good position to know stated that, while the ryot may be very conservative, nevertheless he is keenly alive to improving his condition, and is ready to adopt changes when it can be demonstrated that they will be to his advantage. These informants were particular to insist upon the necessity of demonstration. They state that merely to tell the ryot a thing makes little impression upon him; but show him something that is practical and within his means, and he will probably adopt it.

Over India the soil, seasons, local conditions and agricultural products vary to a great degree. It is said that the variety of ordinary field and garden crops is greater than in any other country in the world. In spite of ignorance, the ryot does not cultivate unskillfully, as he has the advantage of the inherited experience of many generations, all of which have pursued exactly the same vocation as himself. Dr. Voelcker, an authority on the subject, states:—"At his best, the Indian ryot or cultivator is quite as good as, and in some respects superior to, the average British farmer; while at his worst, it can only be said that this state was brought about largely by an absence of facilities for improvement, which is probably unequalled in any other country." He adds that the ryot will struggle on patiently and uncomplainingly in the face of difficulties which to others would present complete discouragement. The native may be slow in taking up new methods; but he will not hesitate to adopt them when once convinced that they constitute an improvement on his present system and are to his advantage. Deputy Directors of Agriculture in various parts of the country have proved this by the great improvement which is being accomplished, through the work of the Agricultural Departments, in supplying good seed to the peasants. Such improvement could be achieved only through the desire of the latter to purchase and use the better quality.

Seed selection has resulted in an increase of 10 to 20 per cent in the output of jute and cotton. This increase has been limited only by the amount of seed available. One might pause here to contemplate the enormous effect which a 20 per cent increase over the whole of the cultivated lands of India would have upon the country. Here are 315,000,000 people, 70 per cent of them living by the soil. An increase of 20 per cent in the fruits of their labour would have an effect so far-reaching as to be incalculable. That this is practicable is amply proved by the results which already have been attained in the short time that Agricultural Departments have been in effective operation.

Apparently agricultural development was not undertaken seriously in India until during the Administration of Lord Curzon. As organization and the securing of a competent personnel took time, actual scientific development has been in force but a comparatively short time. The extraordinary thing is that agricultural administration in India, in view of what it has accomplished, has not been more specialized and adequately financed. It is a fact that to this day there exist Provincial Directors of Agriculture who have simply been chosen from the ranks of the Indian Civil Service without any special training for their work; and a few years ago there were still more. Moreover, it is alleged that the provincial agricultural departments are woefully understaffed and that the policy pursued is not a uniform one. Instead of maintaining a steady progression, the funds allocated to the development of agriculture apparently depend upon the seasons, and consequently vary from year to year. This seems regrettable in view of what might be accomplished for the country by a more settled and aggressive course of action.

IRRIGATION

Irrigation is one of the most prominent factors in Indian agricultural life. Cultivation without irrigation is precarious if not impossible in a country where the annual rainfall is less than 10 or 12 inches; hence a great deal of the land now bearing abundant crops would be entirely useless if it were not for the magnificent system of irrigation which has been installed by the Government of India. This particularly applies to the Punjab and to Sindh, but more or less to the whole of the country, except those parts such as eastern Bengal, Assam and also Burma, where the average rainfall amounts to some 70 inches per annum. But irrigation itself is no new thing in India. It was practised in the earliest days, although the means adopted were of the most primitive.

The irrigation works are of various types, but may be divided into storage and river works, lift and tanks or reservoirs. In river works, the water is dammed up by the construction of a weir, and the water thus stored is drawn off and distributed to the land by means of a network of canals. The lift works usually consist of wells from which water is raised by means of manual, animal or mechanical power, most commonly the first two. Wells supply about 30 per cent of the total irrigation of India. Tanks seem to be more common in the Madras Presidency than elsewhere, and it is estimated that in that province there are no less than 40,000, irrigating areas one acre in extent and upward. No tanks were seen in the Punjab.

According to the *Indian Year Book*, the total area in the year 1918-19, irrigated by all classes of works in India, excluding the Native States, amounted to 25,000,000 acres.

The government irrigation works, taken on the whole, have paid handsomely, not only directly by what they have accomplished towards making arid lands fertile, but indirectly in providing for the needy in times of famine. They have also paid an actual profit. It is estimated that the total capital outlay by the Government on productive irrigation works, up to the end of the year 1918-19, amounted to Rs. 58 crores. The gross revenue amounted to Rs. 742 lakhs, and the working expenses to Rs. 219 lakhs. It will therefore be seen that the net revenue amounted to something over 9 per cent on the total capital outlay, indicating clearly the remunerative character of such productive irrigation works. It is said that in the Punjab the canals yield a revenue of 12 per cent, and the writer was assured by a Government official in that particular province, that the revenue on outlay in respect of the canal was no less than 40 per cent, and that after selling the water at extremely cheap rates.

Two or three new and very large irrigation works are projected—notably one on the Indus above Hyderabad, and not very far from Karachi—which, if undertaken, would probably bring some two million acres under valuable cultivation. But in discussing the possibilities of this work in Karachi, it was stated that there did not seem to be very much hope of its being carried out in the near future. It was added that, like some other useful schemes, it had been under discussion and consideration for many years, and would probably continue to be the subject of discussion and consideration for many more, for such is the way of the country. In view of the enormous value to the state both direct and indirect, which may be expected to accrue from the materialization of these schemes, the outsider, perhaps in his ignorance, wonders how anything could be allowed to retard them. Those in a position to know remarked that it cannot be for any real lack of money, as for such proved works of utility ample funds would be forthcoming from the Indians themselves. Probably these schemes would come to fruition if the Government would give its consent to their being undertaken by private enterprise. In the various provinces agriculture is, as a rule, one of the departments which will be administered under the reform scheme by Indians, and it is sincerely to be hoped that only intelligent and highly progressive officials will be placed in charge of it. Perhaps no other department of the provincial governments can exert such a powerful influence on Indian life, prosperity and happiness, than that of agriculture, owing to the immense assistance it can lend towards increasing the yield of the land.

As has been stated, about 30 per cent of the irrigation is accomplished by means of wells. It is claimed that well water is a third more productive than that from rivers. Wells are chiefly found in the alluvial plains of Central India, which hold enormous supplies of water beneath the surface. The lifting mechanism in connection with wells is most primitive, probably differing very little from that used in the earliest days. It is only in rare instances that mechanical or means other than manual and animal labour are employed. There is no doubt that oil engines connected to pumps would be an eminently satisfactory method of lifting the water, but unfortunately the average landholder does not possess the money to purchase such plants; and even if he did, it is more than likely that he would not be able to maintain them in efficient order.

No doubt in time the use of oil engines will gradually extend. It can very truly be said that their sale in India would present a vast and lucrative field. Windmills are only used, as far as can be learned, on the strip of coast running south from Bombay, if for no other reason than lack of sufficient wind to drive them at the time of year when they are most required.

The contrivances employed for elevating water by manual and animal labour are clumsy and exhaustive of energy, which can be ill-spared by either man or beast. For the farmer, the most popular contrivance is what is known as the "picottah," by means of which water is drawn up in a bucket, suspended on a rope from the end of a weighted lever. This is seldom used for lifts of more than fifteen feet. For depths greater than this the bullock is almost invariably employed, and sometimes even for shallower wells.

The most common contrivance consists of a leather bucket holding from thirty to forty gallons of water, secured to the end of a rope which passes over a pulley suspended above the well. The other end is hitched to a pair of bullocks, which after the bucket has been lowered and filled, walk down a ramp, of a length approximately the depth of the well. The full bucket when it arrives at the top is emptied into a trough by a man standing there, or in some cases by a mechanical arrangement. Another method of raising water is by means of what is called the *harat* (Persian wheel), which consists of an endless chain of earthen waterpots, passing over a vertical support erected above the well; this is turned by oxen attached to a pole circulating round the well. An observer cannot fail to be struck by the amount of water that is wasted by spilling from the earthen pots.

GRAIN ELEVATORS

The question of erecting a chain of elevators in the northern part of India for the handling and storage of grain has been for some time under consideration by the provincial governments concerned. It is possible that if some system of elevators were established, on lines followed in Canada, a means might be evolved for freeing the ryot from the clutches of the money lenders. His grain harvest could be purchased from him direct. As it is, he sells it at a low price, and loses the profit resultant from the increase in the price of grain, which invariably rises later in the season. While this project has been considered, lack of funds prevents its realization in the immediate future.

FERTILIZERS

Essentially an agricultural country, India might be expected to use enormous quantities of fertilizers. But to take only one instance, the export of bones proves the falsity of such an assumption. As the chief phosphate fertilizers are bone meal and superphosphate manufactured from a combination of bone and sulphuric acid, it seems most regrettable that such large quantities of the main constituents of these fertilizers should be sent out of the country when they are so badly needed within it. Another valuable fertilizer, ammonia sulphate, a by-product of the blast furnaces, is also exported, and the quantities of these shipments are shown under the heading of "Iron and Steel" in another part of this report. The production of this chemical is expanding in harmony with the iron industry. Again, another fertilizer is oil seed, produced in larger quantities than can be used. Neither oil seed nor ammonia sulphate are used as fertilizers. In view of the fact that the return per acre in India is probably lower than in any other part of the world, it is greatly to be regretted that a wider use is not made of them.

The beneficial effect of fertilizers on such products as tea, coffee, rubber, etc., has long been realized; while their effect in increasing crops of sugar cane and cotton is beginning to be appreciated. But in spite of this, it may be remarked that the ordinary Indian cultivator has not yet realized the vital importance of the application of a suitable fertilizer to his land. No doubt as a knowledge of scientific agricultural methods permeates the mass of the peasantry and as the number of agricultural banks and co-operative societies grow, the demand for and use of fertilizers will proportionately increase. At present the only method pursued is the time-worn one of applying manure to the land, but as this is also largely used as fuel, it is insufficient in quantity.

CHAPTER III

Agriculture and Natural Resources

CEREALS AND CHIEF VEGETABLE PRODUCTS

The principal crops in India from the standpoint of size and value are respectively rice, wheat, tea, cotton and jute. Also of importance are grains other than wheat (millet, pulses), oil seeds, (linseed, sesamum, mustard); ground nuts (known in Canada as peanuts); coffee, indigo, coconuts, cinchona, rangoon beans, opium, and sugar.

Rice

From the earliest times, rice has been cultivated in India, and it is the staple food of a very large part of the population. It is principally cultivated in Bengal, Bihar and Orissa, Burma and Madras; to a lesser degree in some of the other provinces. In

the year 1917-18, a little over 80,000,000 acres were planted with this cereal. Rice can only be grown in abundance where there is an assured rainfall. It is sown in three ways: (a) broad cast; (b) by drill; and (c) by transplantation from a seed bed where it has originally been sown in the first manner.

Rice is thrashed by beating on a board or a log of wood placed over a large cloth of some kind, so disposed as to catch the beaten out grain. Another method is to trample it out under the feet of oxen. Rice straw, after thrashing, is used to a certain extent for fodder, but it is not considered to be particularly nourishing. An additional use for it is thatching, for which it is extremely well suited.

Although rice is grown so extensively throughout India, only a portion of it is available for export, because of its general domestic consumption as food. The largest amount exported is from Burma, and so well has this become known that "Rangoon" rice is now the standard of Europe. In the year 1919 this province exported 2,201,000 tons. It is estimated that India produces about 40 per cent of the world's supply, with a crop of between 35 and 40 million tons. The average yield per acre is between 8 and 9 cwt. (112 lbs.).

Before hulling, rice is known as paddy; after the completion of the latter process, as raw rice. When it has been cleaned it becomes known to the trade as pearl or white rice. In addition to this, the better grades go through another process in which the grains are polished on sheep skins. In 1919 the export of cleaned rice from India amounted to a little over 2,000,000 tons.

Wheat

India is a very large producer of wheat, of which fair amounts are exported. In 1911 and 1912, the annual production amounted to nearly 10,000,000 tons, which four years later had slightly increased. In the years 1915 and 1916, this amount fell however to less than 4,000,000 tons, exemplifying to a remarkable degree the effect of an unfavourable monsoon; in the two years following, that is in 1917 and 1918, the crops amounted to over 10 million tons. In recent years the largest amount of the grain exported was 1,454,000 tons, of which over 400,000 tons passed through the port of Karachi.

In the year 1919-20, according to the figures published, there was an area sown of 29,976,000 acres, which was an increase of six million acres or 26 per cent over the previous year. The total crop for the former year is given as 10,092,000 tons. In 1920 the export of wheat was restricted. It was predicted by certain economists at the time, however, that this interference with the natural laws of trade would result in a reduced production the following year. The reduced figures given for the area under cultivation this year, would appear to bear out these predictions, although of course, it must be borne in mind that other influences may have combined to bring about this result.

There are no elevators in India, although the erection of one is contemplated at Karachi. However, owing to the extreme dryness of the climate, it is quite possible to store the grain in open sheds without fear of its deterioration. Probably the chief motive for the erection of elevators is more to facilitate handling than for storage purposes.

The bulk of Indian wheat is grown under irrigation, principally in the Punjab, North West Frontier Province, and the United Provinces, and to a certain extent in the Central Provinces and Bombay. To some degree, certainly more so than in connection with other crops, modern machinery is employed in the production of wheat. Nevertheless, the methods employed are in most cases primitive. For instance the wheat is largely cut with a sickle or is uprooted by hand; moreover, like rice it is largely thrashed out by being trampled under the feet of oxen; and to winnow it, it is shaken in the breeze.

Millet and Pulses

Indian millets are of two types, one with large leaves and sturdy stocks which grows to a height of six or eight feet, and a shorter variety which only attains a height of about three feet. Millet is widely used as food for both man and beast. When proper methods are pursued in the cultivation of this cereal, it yields a very large return. The methods of reaping and thrashing are crude and similar to those pursued in the case of wheat.

The most common form of pulse is gram, which is also extensively used for food.

Cotton

Cotton grows extensively in various parts of India, particularly in what is known as the black cotton soil, which is a deep dense clay. The finest grades are produced in such soil in the Broach and Surat districts.

It was affirmed to the writer that the quality of cotton produced today is inferior to the grades formerly grown, on account of the use of a poor seed that promised temporarily greater profits. Unfortunately, many of the lands are unable to rid themselves of this grade. Another reason given for the deterioration of cotton is the practice of separating the seed from the stalk in ginning factories, instead of by the old hand process. This departure has a tendency to spoil the quality of the seed by mixture. Happily the necessity of more scientific methods of cultivation and for proper seed selection has been realized, and in recent years the provincial agricultural departments have done some very fine work in producing a better type of seed which is now sold to the agriculturist. The writer was informed in the Punjab that this policy had already resulted in a considerable increase of profit to the growers. It is hoped that by further prosecution of this work, a comparatively long staple cotton will replace the short staple so commonly grown in India to-day, although it is scarcely possible that Indian cotton will ever equal in quality the United States or Egyptian product.

The Indian Cotton Committee, the report of which was issued in the early part of 1919, entered very largely into the question of improving the quality of cotton grown in India, and made some most useful suggestions to the Imperial and provincial departments in this connection. The report deals in an interesting manner with the improvements which have already been effected in the Madras Presidency, by reason of the excellent work carried out by the government of that province.

The cultivation of cotton begins with the ploughing immediately after the early Monsoon rains. The land is ploughed over several times to be ready for sowing in June. When the plants are a few inches above the ground, the land is cultivated with a bullock hoe or cultivator. In September or October it is ploughed between the rows of plants. It will thus be appreciated that the cotton districts of India should present a good market for manufacturers of ploughs, harrows and cultivators.

About one-half of the Indian production is consumed in the country itself, the remainder being exported. Japan is India's best customer, and in the year 1918 took nearly five times as much as any other country, the next being the United Kingdom with over one million hundredweight.

Jute

Jute is one of the most important crops grown in India, and was responsible for very large profits made by Indian merchants and industrialists during the war.

Ever since the middle of the last century, the demand for jute has been increasing, and consequently its value. This is exemplified in the difference in the price of a bale of jute between the middle of the last century and that in the closing month of the war. The former price was Rs. 14-8, and the latter Rs. 78. Of course the price of jute has not shown an uninterrupted upward tendency, but has experienced many fluc-

tuations. For instance, in 1917 the value of a bale of jute was as low as Rs. 35, while the year before it was Rs. 38.8. The exports have also shown considerable variation in quantity. In 1882, the exports rose to 517,000 tons, and in 1908-1909 to 900,000; in the year 1913-14 they were 768,000, but in the following year decreased to 505,000 and in 1917-18 to 278,000. This, however, only refers to raw jute. The exports of the manufactured product have increased enormously both in value and in quantity.

Jute is grown almost entirely in Bengal over an area of about 5,000 square miles. The conditions necessary for the cultivation of jute are closely analogous to those required for rice: that is, a great amount of moisture. Cultivation begins in the spring after the ground has been softened by the early rains. Like cotton, it is worked over three or four times with a plough and then sown. A peculiarity about jute is that it must be cut before it is fully ripe, and after cutting, the stocks which are tied into bundles, are steeped in water pools to allow for the retting of the fibre. As has been stated, the Department of Agriculture of Bengal is assisting this industry considerably by the distribution of an improved quality of seed. Unfortunately this excellent work is interfered with by unscrupulous dealers who sell ordinary Government seed, at the enhanced price of the latter; the unsuspecting purchaser, unable to tell the difference, only realizes his deception when the plants are well up. This tends to shake his confidence and to impede the splendid efforts of the department. Rice and jute are grown rather in rivalry with each other; that is, if one is inclined to rise excessively in price, it is likely to be grown at the expense of the other. It is very likely that the cultivation of jute will extend to Burma and Assam, both of which are very suitable for the production of rice.

*Tea**

Until the war, the tea industry was a very profitable one for parts of India and the greater part of Ceylon. But, owing to excessive production and particularly to the collapse of the Russian market, and with decreased demand from other parts of the world, this industry has been passing through a severe crisis during the last two years. In the summer of 1920 the writer was assured that in Ceylon tea sold to the London market for half production price. So severe has been the slump in price that many tea gardens went out of production, or contemplated doing so, in the latter half of 1920; or were confining themselves to plucking only the better qualities of the leaves. No doubt, should settled conditions once more prevail in Russia, and former consumption be resumed, an immediate and beneficial result would be felt in this great industry.

In India the production of tea became an industry about the middle of the last century, when the cultivation of the bush was undertaken in Assam, and a few years later in the district about Darjeeling. It was considerably later than this that the cultivation of tea was undertaken in Ceylon; only the necessity of finding some product to replace the island's almost ruined coffee industry forced the planters to this action. In the fifties of the last century the production of tea in India amounted to but 70,000,000 pounds; whereas at the end of the last or early in the present century it had risen to over 200,000,000 pounds. This great increase, in conjunction with the production in Ceylon, was more rapid than the growth of the demand. Tea is grown in India and Ceylon at an altitude of from 1,000 to 7,000 feet, provided that there is assured an abundant rainfall. The bush is so greedy of moisture that it can absorb practically any amount of rain that is likely to fall.

Tea goes through a number of processes between the plucking of the leaf and its packing for shipment. The first process is the withering, now largely performed by artificial means, the leaf being dried by heated air projected over it by revolving fans. Secondly, the leaf is rolled in order to twist the leaves and break up their cellular structure so that they may retain the juice. Next it is graded in a revolving screen

* A detailed statement on the Tea Trade of India is printed as Appendix III to this report (page 167).

to separate the coarse from the fine leaves. After this, for black tea comes the oxidation performed by sprinkling the leaf with cold water in a cool room. It is rolled again and dried, then sorted, sifted, etc. Finally it is heated, and packed in this state in lead-lined tea chests. The motive for heating before packing is due to the readiness of the tea leaf to absorb moisture, which, if permitted, would ruin it.

Coffee

The Indian coffee industry is an older one than the tea industry, having been carried on for nearly a hundred years in the country. It has greatly diminished in importance since the reduction in the price of coffee, owing to the immense quantities thrown on the world's markets by Brazil.

Coffee requires conditions quite similar to those which apply to tea; that is, it grows at an altitude of between 2,000 and 5,000 feet, under a very heavy rainfall. On the best plantations as much as 12 cwt. to the acre has been recorded in a good season, but 400 pounds of clean coffee per acre may be taken as a fair average year. In 1918-19, 218,504 cwt. of coffee were exported.

Indigo

At one time the cultivation of indigo was of considerable importance to India, particularly in the very early days. History records that it was a considerable article of commerce with the Portuguese when they were a great Eastern commercial power. This industry, however, suffered a severe blow on the discovery of the manufacture of synthetic indigo. Owing to cheap production of the synthetic article in Germany, it became very difficult to secure a profit on the estates in India, and exports naturally suffered. From recent reports, however, it appears that the indigo industry is reviving again. Through improved methods of cultivation, such as the use of fertilizers, it seems as if natural indigo may be able to compete with the synthetic. The plant is produced principally in Bihar and Madras.

In the fiscal year 1902-03, 65,877 cwt. of indigo were exported, a decline from the previous year of nearly 25,000 cwt., and prior to the war this trade had further shrunk to less than 11,000 cwt. In 1918-19, it is calculated that about 44,000 cwt. were produced, of which over 32,000 cwt. were exported.

Chinchona

The chinchona plant, from which quinine is produced, is grown in fair quantities in India, although the industry appears to be declining. Cultivation was commenced as far back as 1862 by the Government, with seed procured from South America. It is produced principally in Darjeeling and in the Nilgiris.

Oil Seeds

The principal oil seeds cultivated are linseed, sesamum, rape, and mustard, and these are grown over a considerable area of country, amounting in 1917-18 to over 14,000,000 acres.

Linseed is of considerable interest to Canada, owing to its importance to Canadian crops. In India it is grown almost entirely for the seed, which is exported for oil purposes. However, a certain amount of this is crushed in India and exported in the form of oil. Very primitive machines are employed for expressing the oil.

Sugar

According to the *Indian Year Book* of 1920, sugar is cultivated over some 3,000,000 acres. It is grown almost entirely by irrigation, except in certain parts of Bengal, where there is a sufficient rainfall to obviate such aid. The estimated output

for the last year was about 2,400,000 tons. The Indian sugar industry appears to have undergone certain vicissitudes in later times. It is one of the most ancient industries of the country, dating back to early days, and it is interesting to note that its manufacture is said to have been derived from the Chinese. The consumption of sugar in India is very large.

The report of the Sugar Committee appointed in 1911 to investigate the conditions of growing and manufacture has recently been published. Commenting on this report, the *London Times Trade Supplement* says:—

“There are authorities who hold that the inclusion of the great Indian indigenous industry in the world's totals of sugar production, at any rate until such time as similar figures are available for the inclusion of the crude production of other countries, is misleading, and that the figures should comprise only the small quantity of sugar produced in the Indian factories run on Western lines. However this may be, the problems submitted to the committee have a most important bearing on world supplies, since India competes for the production of other countries. Before the war she was importing no less than 900,000 tons per annum. The rapid rise in world prices and other war factors brought the imports down to half a million tons in 1917-18. In the following year there was some advance on this figure, but the fall has continued since. In 1919-20 the quantity imported was 408,000 tons, while last year it was only 236,000 tons. In the last pre-war year the area under sugar in India had fallen to a little more than 2½ million acres, equivalent to a decline of 8 per cent on the totals for 1890-91; but cultivation has since advanced somewhat, though not to the extent that might have been expected from the high prices for the imported product. The acreage in 1919-20 was 2,814,000.

“The report confirms the well-known anomaly that, while India has a larger area under sugar cane than any other country in the world, constituting, in fact, nearly half the aggregate acreage, her nominal output is but one-fourth of the world's cane sugar supply. This arises from the extraordinarily small production per acre compared with other sugar-producing countries. India is now producing just over a ton per acre, compared with over four tons in Java and over 4½ tons in Hawaii.

“The report draws attention to the fact that an enormous percentage of the sugar contents of the cane is lost through antiquated methods of production and inefficient milling, and particularly by inadequate preliminary crushing. It is pointed out that great improvements could be effected if steps were taken to regulate deliveries, and if the Java system of lifting the cane loads on to a carrier by mechanical means were adopted.

“The committee holds that the organization of the Indian sugar industry on the Java model is essential to progress. The organization should take the form of an Indian Sugar Board composed first and mainly of officials, but becoming ultimately non-official. Some two or three years ago, it may be noted, the Government of India placed Mr. Wynne Sayer, of the Indian Agricultural Service, on special duty to undertake the collection and co-ordination of all available information regarding the industry as the first step toward the formation of the Sugar Bureau, since constituted. The report advocates the establishment of an Imperial Sugar Research Institute to control research work.

“The work has been carried on in recent years by the Agricultural Department and has been valuable so far as it has gone. The cane-breeding station at Coimbatore, in the Madras Presidency, whence the improved varieties of seedling canes are evolved, supplies new and improved varieties throughout the sugar cane areas of India. In his report on 'India in 1920,' Mr. Rushbrook Williams mentions that the results obtained for selected strains of cane show that an average yield of 6,800 pounds of raw sugar per acre is possible as compared with a normal yield of 4,000 pounds. There are substantial indications that the older strains are losing favour with the cultivators and are being replaced by the new varieties. In many places it would seem that the question of improved cultivation is of greater importance than the introduction of

new breeds; for crude sugar manufactured on improved lines fetches from 6s. to 10s. more for every 500 pounds than the produce resulting from the older processes.

"The committee has shown caution on the question of tariff changes, in view of the impending thorough investigation of the Indian tariff policy as a whole. It considers that the present tariff, combined with the ocean and railway rates, should be sufficient to provide ample protection for the Indian sugar industry. The report points out that Mauritius would be the only part of the Empire which would benefit by an Imperial preferential tariff on sugar imported into India."

Rangoon Beans

Rangoon beans are grown in the province of Burma, in sufficient quantities to permit export. In the fiscal year 1917-18 they were shipped to the amount of 230,000 tons, valued at the time at about \$2,500,000. Formerly these beans were imported into Canada in considerable quantities, but shippers in Rangoon complained that this trade has now practically ceased, owing to the fact that the beans were alleged to contain a slight percentage of prussic acid. The Rangoon shippers claimed that this is so small as to be entirely negligible, but whether that be so or not, their admission into the United States and Canada has been prohibited. It is understood that experiments are being undertaken by the Agricultural Department in Burma with a view to raising a bean in which this objectionable element will be entirely eliminated.

Opium

Opium is cultivated under a system of Government license; but these are only issued on the specific understanding that the whole of the crop shall be available for the Government factories in the United Provinces. Since an arrangement for the export of opium has been arrived at with China, the industry has greatly decreased; to-day it is hardly a quarter of what it was a few years ago. In the fiscal year 1919-20 opium was exported to a value of only Rs. 196 lacs, the lowest quantity ever recorded.

Coconuts and Copra

The coconut industry is of considerable importance to the coastal portion of the Madras Presidency. It is estimated that about half a million acres are planted with the tree. The industry is said to be almost entirely in the hands of small cultivators. The coconut produced along this coast is inferior to the product of the Straits Settlements, as only 4,000 nuts in the latter are required to produce one ton of copra, against 7,000 in the former. To improve the Madras product, the agricultural department of that presidency has taken up the study of the coconut, and experimental stations have been opened for this purpose.

The coconut tree and its fruit have many uses besides its main one—the production of copra. Coconut oil is extracted from the kernel; coir is made from the fibre; the leaves are used for thatching and also for the manufacture of native brooms, baskets, and umbrellas; the empty shells are employed as fuel; and a spirit is made from the juice. Copra is the term applied to the kernel of the nut; from this is extracted the oil which has many commercial uses, the principal of which are the manufactures of margarine and soap. While the Madras coconut is inferior in size to others, its copra is said to have a very high value because of its high percentage of oil.

Condiments

India is well known as a producer of condiments and spices, which are of sufficient importance to necessitate the setting aside of over 1,500,000 acres for their production.

Tobacco

Tobacco is grown in fair quantities, and Indian cheroots have a world-wide reputation. The best are produced in the southern part of the country, in the district of Trichinopoly. Tobacco cultivation extends over about 1,000,000 acres.

LIVE STOCK AND DAIRYING

There are in India very large numbers of live stock, chiefly cattle, buffalo, sheep, goats, and some horses. Cows are kept usually for working purposes, and although they also produce milk, this is more commonly obtained from the buffalo that yields a richer quality.

Cows are sacred, and in consequence instead of being killed at the proper age, they are allowed to live until they become old, decrepit, and quite useless for either breeding or working purposes. This results in an enormous accumulation of useless stock, which the land with its lack of grazing is ill fitted to sustain. The sacred character of this animal also makes it difficult to weed out poor stock with the object of improving the breed. The principal provender is straw, which unfortunately provides little nourishment, so that during the busy seasons the condition of the stock can easily be imagined. The Indian cultivator does not undertake hay making, and even forest grass as a rule is not gathered. Consequently no surplus of food is ever accumulated to provide for the lean years, with the result that in seasons when the Monsoon partially fails, the mortality amongst cattle is enormous.

The latest reports give the number of cattle in British India as 86,802,961, and buffaloes 19,235,333, or a total of 106,038,294 head of large stock. These are chiefly distributed over the United Provinces, Madras, Bengal, and Bihar and Orissa. The number of sheep is computed at 22,894,571, and goats at 33,165,499. Sheep are chiefly bred in Madras, the Punjab, the United Provinces, and Bombay, whereas goats are largely confined to Bengal, and Bihar and Orissa. In addition there are 1,680,940 horses and ponies, 1,534,341 donkeys, and 70,940 mules, and 499,903 camels.

Sheep and Goats

The poorer people keep goats for milking purposes; a good milking goat gives about four pounds of milk daily. In addition to goats there are also a considerable number of sheep. As these, however, are not nearly so prolific as the goats, they are consequently less numerous. Where the natives eat flesh, that of the goat is chiefly used in the place of other meats.

*Buffalo**

Buffaloes are largely used in Bengal, both for work on the farms and for transport purposes. To thrive they must have access to an adequate supply of water sufficiently deep to permit of constant bathing. As mentioned above, buffalo milk is richer than cow's milk, and the yield is as high as thirty pounds per day.

Dairying

The dairy industry is not specially important. Agricultural departments are directing their attention to the improvement of breeding with a view to increasing the value of the dairy industry. Under existing circumstances it is a difficult task, for in many parts of the country the cattle are ordinarily allowed to roam about together, which naturally results in the production of a very mixed and inferior type. Even if the sexes were separated, it would be absolutely impossible to breed sound cattle without adequately feeding them. The finest cattle the country possesses are raised in the northern part of Guzerat, where there are good grazing lands. Mysore is also noted for its cattle.

* For production of hides, see "Industries," page 31.

MINERAL PRODUCTS

Mineral production in India is of considerable importance, and the output of the principal area has largely increased in the last twenty years. In 1898, the total output is given as £3,455,565; in 1918 it had risen to £15,771,085. The table below shows the respective values of the chief minerals:—

	1898	1918		1898	1918
Coal...	£ 957,162	£6,017,089	Manganese...	£27,426	£1,481,735
Gold...	1,608,504	2,060,152	Iron ore...	12,403	47,298
Salt...	312,682	1,644,211	Tin...	2,553	134,635
Salt-petre...	265,896	589,190	Lead...	.....	450,477
Petroleum...	67,897	1,131,904	Tungsten...	.....	726,321
Rubies...	57,950	40,310	Silver...	.....	295,696
Mica...	53,890	625,741			

The utilization of modern machinery is not general throughout the country, although where it has been installed, particularly in the form of coal cutters, it seems to have given great satisfaction. It has revealed its advantages over even the generally employed native labour, for although labour is cheap, it is not entirely satisfactory. The underfed Indian has nothing like the stamina of the European or American miner. The difference between the Indian and the English miner's output below ground is 181 tons for the former against 323 tons for the latter; above ground it is 113 tons against 251 tons. These are the figures for 1916. At the present time about 150,000 persons are employed in the Indian coal fields. The miners are largely drawn from the agricultural class. This does not result very satisfactorily to either industry, since if the Monsoon is favourable the native wants to farm, whereas if it is the reverse he turns to mining as offering better prospects. The alternative employment thus open to him may be convenient to the labourer, but as can be well imagined, it is a matter of much inconvenience and worry to the colliery manager.

Coal

Coal is the most important mineral produced in India, although its discovery is of comparatively recent date. The chief mines are situated in Bengal, and Bihar and Orissa, although a small tonnage is produced in other parts of the country, chiefly in the state of Hyderabad. To show the expansion of the industry, it may be mentioned that in 1884 only 1,399,000 tons were mined, as against over 7,000,000 in 1903, and nearly 21,000,000 in 1918.

India has now entered the coal export field, but owing to the lack of railway rolling stock, it has not been possible to take full advantage of the markets offered. Indeed, recent advices state that the shipment of coal out of the country has been almost entirely prohibited. The chief markets available have been Ceylon, the Straits Settlements, and to a certain extent the Netherlands East Indies. It is not likely that this trade will develop, as the expansion of the Indian railways and the industries of the country will probably require all the increased production for some time to come.

Copper

In 1917 the output of copper ore amounted to 20,000 tons, but for one reason or another, this dropped to 3,619 tons in the following year. The highest year previous to 1917 was 1912, when 8,984 tons were produced.

Chromite

Chromite is found in various parts of India, particularly in Baluchistan and Mysore. The total output in 1918 was nearly 58,000 tons.

Saltpetre

Another mineral worthy of note is saltpetre. In the year 1910, the exports of this mineral amounted to 18,000 tons, which five years later had fallen to 13,000 tons, to again rise in 1919 to 24,000 tons.

Mica

A few years ago, India produced something like three-fifths of the world's supply of mica, but latterly Brazil has actively competed. The bulk of the mica mined in India is "muscovite," in the Province of Bihar and Orissa and in the Madras Presidency. Small quantities of "phlogophite" are found in Travancore. The Bihar and Orissa mica, which is principally of the ruby variety, is reputed to be the finest in the world and is in great demand for electrical industries. While Canada is a fairly large producer of mica, she also imports quantities of Bihar mica for use in electrical works. One feature of the Indian product is the size of its sheets, which run to over forty-eight square inches and are known to shippers as "extra special." Other qualities are known as "special," "clear," "slightly stained," etc.

Among other minerals of value are corundum, monosite, rubies, gold and manganese.

INDIAN FORESTS

The Indian forests are of very great value to the country, and are in consequence very carefully administered by the government. To supervise these forests, which cover some 250,000 square miles throughout the length and breadth of the peninsula, the government organized the Indian Forest Service, probably one of the most efficient of its kind in the world.

Twenty years ago Indian forests produced over 300,000,000 cubic feet of timber, of which a large proportion, chiefly teak, sandal and ebony, was exported. The Government derives the considerable revenue of rather more than £1,000,000 sterling from its forests; and so important is the timber industry to Burma that teak alone is said to be responsible for 40 per cent of its income. Not only are the forests of India valuable for their timber, but they also conserve the rainfall, thus providing a considerable amount of grazing in a country in which it is of the greatest importance.

A cubic foot is, as a rule, the unit of sale for timber. The method of measurement is known as Hoppus, and refers to the length by the square of the quarter girth measure.

Indian timber is later dealt with under the heading "Timber and Paper." Besides timber, other products of the forest are lac, cutch, gambier, myrobalans, and cardamon.

Lac

Lac cultivation might be classified as one of the minor industries of India. This product is the resin of an insect of the genus *Tachardia* which frequents particular trees in the forest. It is produced chiefly in Sind and the Central Provinces, and although used to some extent locally, is also exported after treatment in the form of shellac. From lac are also obtained two other products, one a deep red dye, and the other a resin used in the manufacture of sealing wax.

CHAPTER IV

Industries

Apart from agriculture the principal industries in India are the manufacture of jute and cotton products, and the preparation of hides and skins.

JUTE

This industry was established in India in the year 1855, and has made steady progress ever since. The first power loom was not operated until 1859. In 1883 there were only twenty-one mills at work, which were equipped with 88,000 spindles and 5,500 looms; in 1919 the number of mills had increased to seventy-five, the spindles to 124,000, and the looms to 39,300. In 1883 the combined capital of the twenty-one mills amounted to Rs. 271 lacs, which in the last year mentioned had increased to over 14 crores, or, at the nominal rate of exchange, \$67,000,000. This industry has not halted; new mills are constantly being established.

The manufacture of jute is conducted almost entirely on the banks of the Hoogly in the neighbourhood of Calcutta, both above and below the city. The great strides which the industry has made in recent years have cut very deeply into the Dundee trade. It may be said that formerly gunny-bags and hessians were controlled from the Scottish city; now control has passed to the Bengal mills, and more particularly the Indian Jute Mills Association.

As will be seen in the reference to jute under the heading of "Agriculture," at one time the bulk of it was exported; even as late as 1914 over half of the crop was shipped abroad. But this phase has passed into the more permanent one of manufacturing the locally grown fibre within the country. According to the latest figures, the export of gunny-bags in 1919 amounted to nearly 584,000,000, and of hessians to 1,103,000,000 yards, the two combined being valued at something like £43,000,000.

Raw jute and jute products have to bear an export duty which for the former amounts to Rs. 4-8 per ton, for hessians Rs. 32-8, and for sacking Rs. 20 per ton. Cuttings and the raw jute pay Rs. 1-4 per ton.

As jute in the form of gunny-bags and hessians is of considerable interest to Canada owing to the large imports, a description of the jute trade of Calcutta, very kindly prepared by a prominent and experienced Calcutta merchant, is printed as Appendix I to this work (see page 163); and a letter by a Calcutta firm to a Canadian importer, explaining the method of purchasing and shipping jute products, appears as Appendix II (see page 165).

COTTON

The consumption of Indian raw cotton within the country is slowly increasing. In 1911 this amounted to 6,500,000 cwt., which had increased in 1918 to 7,200,000 cwt., which is about half of the amount grown.

The cotton industry, like that of jute, has undergone great expansion in recent years. In 1880 there were only 58 mills, having 1,471,000 spindles and 13,000 looms. In 1898 the number of mills had increased to 174, with 4,463,342 spindles and 37,288 looms. In that year there were 156,132 hands employed, and the consumption of raw cotton amounted to over 5,000,000 cwt. (112 pounds). In 1915 the mills had increased to 267, the spindles to 6,848,744, and the looms to 108,009, the hands employed to 265,346, and the consumption of raw cotton was nearly 7,500,000 cwt.

The majority of the mills are in the Bombay Presidency, and the remainder are situated in various parts of the country, particularly the provinces of Bengal, Madras, and the United Provinces. Although Bombay leads in the manufacture of cotton,

the first mill, started in the early part of last century, was near Calcutta. It is worth noting that although Europeans take such a large part in Calcutta in the manufacture of jute—in fact the industry is almost entirely in their hands—yet in Bombay the reverse is found, and there one discovers that the cotton industry is controlled by Indians and Parsees to a like extent.

Two of the finest mills in India are situated in the city of Madras; they are entirely modern and are probably as well equipped as any in the world. One interesting feature in connection with these mills is the welfare work carried on, the aim being to raise the standard of living amongst their employees, and at the same time to catch their boys while still young, and by an excellent system of education, to instil in them a desire to take up mill work. This is having an admirable effect. The writer went over these mills and their compounds, including the schools, and it can be safely said that they would be a credit to any country in the world.

In the fiscal year 1916-17 over 681,000,000 pounds of yarn of all counts were spun in India. This decreased to 660,000,000 pounds in the following year, and in 1918-19 there was a still further drop to 615,000,000 pounds. About half of the raw cotton consumed by the mills is exported in the form of yarns.

The number of yards of piece goods woven in 1916-17 amounted to 1,518,000,000, which increased in the following year to 1,614,000,000 yards, but dropped in the year after that to 1,451,000,000 yards.

Cotton manufacture in India was prosecuted from very early years, and the name "calico," with which we are so familiar, is derived from the city of Calicut. Long before India came under British rule, or even before the route around the Cape of Good Hope was discovered, some of the products of the looms of India were sold in Europe. The muslins of Dacca have been famous for centuries. The popular method in the old days of testing the fineness of Dacca muslins was to pass the cloth through a lady's ring. Still, in spite of the fineness of these beautiful muslins, they are probably not superior to those which are made in Europe. Dr. Taylor states that a skein of yarn which a native weaver measured in his presence proved to give a length of 250 miles to one pound of cotton.

It is unfortunate that the quality of Indian cotton yarn should be lower than it was in former years. The apparent reason is that it is found more profitable for manufacturers to use a short staple than a long. Consequently there is no incentive to grow the latter, so that it is not surprising that the long staple cotton of India, from which was made the material so admired in Europe, has gradually disappeared, and has been replaced by a much inferior, although perhaps a temporarily more profitable grade.

It might be mentioned that hand-weaving still occupies an important part in the life of the village communities, and it is extraordinary the number of hand looms which are even at this day employed by the villagers.

Silk

Silk would not appear to be a particularly flourishing industry in India, and apparently never took an important hold on the industrial life of the country until its culture was encouraged by the old East Indian Company. In its early days it seems to have prospered, but subsequently it fell upon less fortunate times, due, it is said, to faulty methods in the rearing of the silk worms.

LEATHER INDUSTRY

The business connected with dealings in hides and skins and with leather tanning in India is of considerable size. The year before the war the export of hides amounted to 1,900,000 cwt., valued at nearly £11,000,000. In the past Canada has imported a considerable number of hides and skins from India. A description of the business, kindly contributed by one of the best authorities in Calcutta on the subject, is printed as Appendix IV (see page 169).

Indian hides vary greatly in size, according to the breed of cattle from which they are taken, and their province of origin. Unfortunately large numbers are greatly depreciated in value owing to the custom prevalent in the country by which animals are branded all over the body. This is more noticeable in some parts of India than in others. In Ceylon the animals are marked with fancy devices, which must utterly ruin their hides for commercial purposes. There is also great room for improvement in the system of flaying and curing, as the methods at present employed are exceedingly primitive. Elsewhere, under the heading of "Agriculture," a reference is made to the poor quality of the cattle maintained in India, and in consequence of this it can be readily realized that the hides of these animals have nothing like the value of those produced in certain other countries of the world.

The hides are cured by wet salting, dry salting, and by air drying and arsenication. It is those which are cured by the latter process that are exported. Unfortunately, the method of curing encourages adulteration, and with the fatal idea of trying to deceive the buyer, some of the Indian dealers plaster the hides with mud, lime, etc., with a view to increasing their weight.

Quantities of leather are tanned in India, and this is utilized by the leather works in the manufacture of boots and shoes, trunks and bags, saddlery, etc. Although not equal to the best English and North American leather, nevertheless it is of very good quality and well suited for the object for which it is employed. The provincial governments of India are making praiseworthy efforts to improve the methods of tanning, and to provide means for training Indians in the best practices of the industry. Just outside Calcutta, the Bengal Government has established a tannery for the purpose of training tanners and of carrying on research work. So far as can be judged it is doing valuable work.

The country is well off for tanning materials, including acacia arabic, myrabolans, cutch, tarwood, cassia auriculata, avaran, and Indian sumach. Those mostly used are acacia and cassia. Before the war the preparation of hides and skins in Madras was one of the principal industries of that Presidency, but it is also of importance in the Presidency of Bengal and the Central Provinces, where large tanneries are located.

Tanneries vary in size from the small Indian-owned and native-managed to the large establishments employing hundreds or even thousands of hands. The Indian tanner is often ignorant, and it is said of him that he frequently "makes a good hide into bad leather." The city of Cawnpore is quite a centre for the tanning and leather manufacturing industry. Chrome tanning is practised to a certain extent, according to the report of the Indian Industrial Commission, but at the time of the compilation of the commission's report it had not made much headway. It may be of interest to mention that about three-fifths of the upper leather used in the United Kingdom in the manufacture of boots and shoes for the British and Allied armies originated in India.

PAPER MAKING

Paper making was established in India about fifty years ago. Up to the period of the war the paper mills of India do not appear to have enjoyed much prosperity, but from that time the industry seems to have experienced quite prosperous days. One company, for instance, paid no dividends for three years to 1915, but by 1919 its profits had amounted to 55 lacs on a capital of only 34 lacs, and the dividends paid out that year amounted to 55 lacs per cent. At the present time, the output of Indian mills is said to be equal to about 30,000 tons a year; but this is not nearly sufficient to supply the needs of the country.

For a number of years the Government have been experimenting in new sources of raw material for the manufacture of pulp, and a great deal of attention has been attracted by bamboo, of which an enormous quantity could be grown. A good deal

of optimism was expressed as to the possibilities of this source; but those most interested—that is the managers of the industry—state that the process was still in the experimental stage. There is little doubt that if it proves to be the success anticipated, it will have a considerable effect upon the paper trade. India may one day appear as a very considerable exporter of pulp and paper.

HYDRO-ELECTRIC POWER

Up to the present, in view of its many opportunities, India has produced comparatively little hydro-electric power. There are only about three undertakings of importance, that is, the Tata Hydro-Electric Scheme, in the western Ghats near Bombay, one on the Kovary river referred to in another part of this report, and a third in Kashmir. The following description of the Tata Hydro-Electric Scheme is taken from the *Indian Year Book*, 1920:—

“The hydro-electric engineering works in connection with the project are situated at and about Lonavia, above the Bhor Ghat. The rainfall is stored in three lakes



Calcutta High Court.

at Lonavia, Walwan and Shirawta, whence it is conveyed in masonry canals to the forebay or receiving reservoir. The power-house is at Khopoli, at the foot of the Ghats, whither the stored water is conveyed through pipes, the fall being one of 1,725 feet. In falling from this height the water develops a pressure of 750 pounds per square inch, and with this force drives the turbines or water wheels. The scheme was originally restricted to 30,000 electrical horse-power; but the company, in view of the increasing demand for power from the Bombay mills, decided to extend the works by building the Shirawta dam and issued further shares, bringing the capital to Rs. 3,00,00,000, the capacity of the scheme being increased to more than 40,000 electrical horse-power. Issued capital 7 per cent, preference 8,735 shares, fully paid, and ordinary 18,000, out of which 10,000 are fully paid, and 8,000 new shares, on which Rs. 400 have been called up. There is also a debenture loan of Rs. 85 lakhs. The works were formally opened by H.E. the Governor of Bombay on the 8th February, 1915. At present there are altogether 36 mills with motors of the aggregate B.H.P. of 40,000 in service. In addition to the cotton and flour mills, which have contracted to take supply from the company for a period of

ten years, the company have entered into a contract with the Bombay Electric Supply and Tramways Company, Limited, for energy required by them for two of their sub-stations, and the necessary plant for one of these has been ordered. There remain many prospective buyers of electrical energy, and the completion of the company's full scheme will not suffice for all such demands. Besides the Bombay cotton mills, which alone would require about 100,000 horse-power, there are for instance tramways, with possibilities of suburban extensions. The probable future demand is roughly estimated at about 160,000 h.p."

In addition, a certain amount of power is developed in the Himalayas near Darjeeling, and one or two other cities, but only for the purpose of supplying light. The other schemes are used in connection with industries, and particularly the one near Bombay, which is most beneficial to the cotton mills. It is said that the real industrial future of Bombay is bound up with the possibility of water-power, and there is no doubt that the prospects for developing large quantities of electrical energy in the hills, within a reasonable distance of the city, are exceedingly good. It is expected that about one and a half million horse-power will eventually be developed in the western Ghats, and this can be either used in Bombay or along the coast, for chemical industries, manufacture of nitrogen, etc.

One of the difficulties in connection with the erection of water-power schemes is that the rainfall in India is neither regular nor continuous. At certain seasons of the year there is an abundance of water, and at others there is very little; and the supply also varies from year to year according to the Monsoon. It is therefore necessary to conserve the water by large dams, which of course add very heavily to the cost of construction. Apart from this, while Bombay is fortunate in being within a reasonable distance of water-falls, other industrial parts of the country are less so. As it is at present, there seems no likelihood of such cities as Calcutta being supplied with hydro-electric energy in the near future—at least not in sufficient quantities for their needs.

Elsewhere the irrigation schemes of the Government have been described, and in connection with these it may be said that they have not infrequently presented opportunities of developing electrical power. The water can first be used to drive the turbines of the generating stations, and then distributed over the fields. A comparison between the cost of water power and steam power in India entirely depends upon the distance of power stations or fuel supplies from any particular centre. The range of prices at which coal can compete with water power would lie somewhere between Rs. 10 and Rs. 30 per ton.

In Bombay, hydro-electric power is sold at Rs. 55 per unit, as against a price for steam power of Rs. 1.05. For steam to compete with hydro-electric power, it is necessary at the present time to deliver coal at Bombay at a price of about Rs. 17.

IRON AND STEEL

While iron and steel production in India was carried on by primitive means as long ago as the beginning of the 9th century, it was only recently that modern processes were successfully demonstrated. Deposits of iron ore of good quality are proved in many parts of India, but usually at some distance from the coal supplies. With the development of hydro-electric power, however, the recent enormous development has been made possible.

A description of the Tata Iron and Steel Works at Sakchi (Jamshedpur), written a year ago by the general manager of this huge corporation (and recently very kindly brought up to date by the acting general manager in the absence of the original writer), is printed as Appendix V of this work (see page 172), as it is thought that it will be of considerable interest to Canadian industrialists. This company is probably the largest iron and steel concern in India. Starting in a comparatively small way, it has steadily increased to its present proportions.

CHAPTER V

Statistics of the Trade of India

SUMMARY OF GOODS IMPORTED FROM FOREIGN COUNTRIES INTO BRITISH INDIA FOR THE TWELVE MONTHS ENDING MARCH 31, 1919, 1920, 1921.

(Italics indicate articles duty free)

(N.B.—Only those articles which Canada might supply are included. The figures referred to in the text of this report are generally for 1919 and 1920, but since the report was put into type the 1921 figures have become available.)

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
APPAREL—			
Apparel (including drapery, uniforms, accoutrements)	1,17,12,418	1,19,47,989	1,82,46,918
Hats, caps, bonnets, and hatters' ware	15,18,676	12,43,561	42,83,785
EXPLOSIVES—			
Blasting fuse	3,31,138	1,93,973	3,24,877
Blasting gelatine	50,882	3,26,730	3,26,650
Dynamite	4,00,917	1,46,852	3,44,905
Gelatine dynamite	11,30,875	1,73,688	2,87,353
Other nitro-compound explosives . . . . .	.....	1,06,373	1,80,312
Detonators . . . . .	.....	54,066	94,905
Others	3,93,586	1,25,910	1,33,976
ASBESTOS—			
Raw . . . . .	.....	4,528	713
Asbestos packing . . . . .	.....	.....	7,71,450
Manufactures (except for packing) . . . . .	.....	3,02,042	10,97,593
BELTING FOR MACHINERY—			
Of cotton . . . . .	.....	14,03,499	37,23,959
leather	33,12,405	21,12,825	64,04,450
other material (including coir)	50,50,811	18,91,754	44,81,214
BOBBINS	37,36,716	38,79,920	61,87,565
<i>Books, printed, and printed matter (not being stationery), including maps and charts</i>	50,80,236	42,35,356	65,99,989
BOOTS AND SHOES—			
Of leather	25,59,901	31,93,274	93,30,975
other materials	6,45,557	5,84,813	12,52,264
BRUSHES AND BROOMS . . . . .	.....	.....	4,16,255
Brushes . . . . .	.....	.....	5,42,735
Paint and varnish brushes . . . . .	.....	1,06,444	7,30,846
Toilet brushes	6,89,398	3,69,076	41,947
Other brushes . . . . .	.....	4,39,716	.....
Brooms . . . . .	.....	44,719	.....
CEMENT—			
Portland . . . . .	.....	78,02,268	1,34,95,547
Boiler covering	39,06,498	2,354	20,824
Other kinds . . . . .	.....	14,55,755	4,27,119
Total of cement			
From United Kingdom	13,19,702	75,96,395	1,32,15,562
China	8,61,615	4,20,266	2,88,698
Japan	16,95,451	9,72,925	44,343
Other countries	29,730	2,70,791	3,94,887
ACIDS—			
Acetic (Pyroligneous) . . . . .	.....	1,36,162	2,08,431
Carbolic . . . . .	.....	22,981	42,997
Citric . . . . .	.....	.....	1,30,334
Nitric	10,808	69,425	1,84,275
Oxalic . . . . .	.....	13,486	62,373
Sulphuric	2,971	1,06,665	2,79,566
Tartaric . . . . .	.....	3,29,068	3,35,408
Other sorts	15,94,882	1,87,430	2,18,190

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
BLEACHING MATERIALS—			
Bleaching powder (<i>calcium hypochlorate chloride of lime</i>)		{ 12,95,709	36,24,354
Other sorts.	19,91,259	{ 29,858	40,110
Carbide of calcium.	23,11,999	1,71,129	2,87,617
DISINFECTANTS—			
Naphthalene.	10,25,273	{ 92,277	1,05,924
Others.		{ 6,75,772	7,61,425
GLYCERINE.			1,55,809
SODA COMPOUNDS—			
Soda bicarbonate.	17,96,600	6,90,737	7,50,018
bichromate.		1,85,987	8,01,795
caustic.	21,99,499	16,21,884	16,54,778
chromate.		19,747	
sulphide.		41,263	7,05,450
Sodium carbonate.	41,03,522	25,82,574	41,19,106
Cycles, imported entire or in sections.	8,40,679	19,13,026	55,76,477
Parts of cycles and accessories (<i>excluding rubber tires</i>).	10,69,093	13,02,216	35,66,449
Proprietary and patent medicines.	24,50,647	30,48,798	28,11,775
Quinine salts.	23,26,319	23,32,270	35,41,863
Other sorts.	68,93,021	87,08,244	1,07,36,542
Electroplated ware.	4,13,101	5,43,432	15,66,899
FISH—			
Fish, dry, unsalted.	3,05,341	2,78,113	4,62,359
dry, salted.	10,17,907	14,04,424	13,20,732
Fishmaws and sharkfins.	1,88,569	2,15,800	2,45,388
Fish, wet, salted (<i>ngapi</i>).	2,066	2,627	23,788
other sorts.	2,684	554	7,275
Furniture and cabinetware.	13,67,762	13,31,793	54,53,715
GLASS AND GLASSWARE—			
Bottles and phials.	30,59,011	30,06,649	54,56,777
Sheet and plate.	18,22,644	36,00,536	71,11,083
Tableware (<i>including decanters, etc.</i>).	8,46,142	16,45,654	15,45,327
HARDWARE (<i>excluding CUTLERY AND ELECTROPLATED WARE</i>)—			
Agricultural implements.	18,91,538	20,07,041	42,93,150
Buckets of tinned or galvanized iron.	35,981	53,539	3,83,015
Builders' hardware.	19,42,597	19,21,349	67,17,332
Domestic hardware <i>other than enamelled ironware</i>	5,53,615	10,14,839	27,13,105
Enamelled ironware.	11,18,990	29,32,221	42,97,843
Gas mantles.		4,70,878	7,29,607
Implements and tools, <i>other than agricultural implements and machine tools</i>	60,24,456	61,40,174	1,18,16,253
Lamps, metal.	20,67,890	34,37,762	71,00,771
Parts of lamps, <i>other than glass</i>	5,58,139	6,30,784	17,81,692
Stoves.			10,05,933
Other sorts.	1,78,90,276	2,50,53,609	4,99,99,667
Total of Hardware (<i>excluding Cutlery and Electroplated Ware</i>)—			
From United Kingdom.	1,15,11,066	2,05,49,412	5,26,24,298
Belgium.		29,725	4,08,391
Japan.	92,62,937	74,49,886	75,81,274
United States of America.	99,45,999	1,32,92,495	2,25,53,103
Other Countries.	13,63,480	23,40,678	76,71,302
INSTRUMENTS, APPARATUS AND APPLIANCES—			
Electrical, <i>including telegraphic and telephone apparatus, not being machinery</i> —			
Electric fans and parts thereof—			
From United Kingdom.	2,21,371	2,51,511	14,82,626
Holland.	6,335		34,710
Italy.	10,23,830	5,39,289	6,13,362
Japan.	32,285	2,607	10,644
United States of America.	14,00,505	13,47,868	18,31,692
Other countries.	1,095	2,220	17,262
Insulations, other than rubber—			
From United Kingdom.		12,16,460	40,21,740
Japan.		44,634	1,14,445
United States of America.		1,26,078	23,561
Other countries.		6,746	9,510

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

	Value, Twelve Months, April 1 to March 31		
	1918-19	1919-20	1920-21
Principal Articles	Rs.	Rs.	Rs.

INSTRUMENTS, APPARATUS AND APPLIANCES—Con.

Telegraph and telephone wires and cables—			
From United Kingdom.. . . . .	.....	.....	2,80,829
Japan.. . . . .	.....	.....	16,033
United States of America.. . . . .	.....	.....	17,704
Bare copper wire (Electrolytic), other than			
telegraph and telephone wire—			
From United Kingdom.. . . . .	.....	1,80,886	6,38,580
Japan.. . . . .	.....	1,92,723	4,09,370
United States of America.. . . . .	.....	78,893	10,58,731
Other countries.. . . . .	.....	.....	72,533
Total of Electric wires and cables—			
From United Kingdom..	4,98,539	34,66,202	99,16,200
Japan..	27,44,639	4,48,282	6,47,235
United States of America..	3,00,145	5,48,260	14,85,663
Telegraph and telephone instruments and apparatus—			
From United Kingdom.. . . . .	.....	2,44,247	3,15,415
United States of America.. . . . .	.....	2,67,177	83,809
Electric lamps and parts thereof—			
Electric glow lamps—			
From United Kingdom.. . . . .	.....	74,918	10,44,836
Holland.. . . . .	.....	16,984	4,65,775
Japan.. . . . .	.....	13,798	28,941
United States of America.. . . . .	.....	43,174	83,143
Other countries.. . . . .	.....	1,762	67,528
Electric lamps, other sorts—			
From United Kingdom..	7,75,764	4,16,072	3,51,034
Holland..	10,66,923	1,76,452	2,25,275
Italy..	4,744	3,260	3,610
Japan..	4,65,478	1,02,414	85,351
United States of America..	1,61,081	1,91,014	52,101
Other countries..	1,18,544	8,706	17,248
Batteries—			
From United Kingdom.. . . . .	.....	56,484	1,05,930
United States of America.. . . . .	.....	2,50,457	1,68,047
Carbons, electric (including furnace electrodes)—			
From United Kingdom.. . . . .	.....	.....	67,463
United States of America.. . . . .	.....	.....	12,253
Accumulators (including parts)—			
From United Kingdom.. . . . .	.....	.....	14,15,248
United States of America.. . . . .	.....	.....	1,12,295
Condensers, electric—			
From United Kingdom.. . . . .	.....	.....	283
United States of America.. . . . .	.....	.....	48,340
Electric lighting accessories and fittings (including switches)—			
From United Kingdom.. . . . .	.....	.....	27,72,555
United States of America.. . . . .	.....	.....	2,30,269
Other countries.. . . . .	.....	.....	1,04,749
Electrical instruments (other than telegraphic and telephonic)—			
Meters—			
From United Kingdom.. . . . .	.....	2,47,615	7,11,917
United States of America.. . . . .	.....	11,306	49,742
Other countries.. . . . .	.....	80,117	78,763
Switch boards (other than telegraph and telephone)—			
From United Kingdom.. . . . .	.....	3,20,607	3,56,362
United States of America.. . . . .	.....	2,65,598	1,88,099
Electrical goods and apparatus, not enumerated—			
From United Kingdom..	23,77,338	29,23,655	1,02,55,360
Japan..	9,25,859	2,01,226	4,53,549
United States of America..	17,02,932	27,03,987	51,33,692
Other countries..	20,418	40,462	2,03,748

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
INSTRUMENTS, APPARATUS AND APPLIANCES—Con.			
Total of Electrical, etc.—			
From United Kingdom..	38,73,012	80,01,311	2,88,82,570
Holland..	13,46,667	2,14,732	7,33,277
Italy..	11,91,751	5,98,147	7,56,217
Japan..	41,68,261	8,12,532	12,65,824
United States of America..	35,64,663	56,28,741	95,02,834
Other countries..	1,78,307	2,40,425	6,97,917
Musical..	14,15,113	10,94,802	37,24,824
Optical..	5,54,506	7,42,351	17,11,856
LEATHER—			
Hides, tanned or dressed..	2,36,077	7,72,527	11,72,915
Skins, tanned or dressed..	16,22,448	5,31,206	8,77,525
Unwrought..	6,09,336	4,95,364	12,45,602
Leather cloth..		1,60,520	6,32,568
Artificial leather..		56,106	2,80,796
Manufactures (excluding boots and shoes and belting for machinery)—			
Bags and trunks..	1,55,068	3,65,203	7,47,183
Pickers..		5,68,570	12,28,654
Picking bands and straps..		4,19,516	18,59,109
Roller skins..		5,65,227	15,59,507
Saddlery and harness..	2,26,965	2,65,439	7,06,708
Other sorts..	11,05,554	12,23,329	25,52,532
Total of Leather—			
From United Kingdom..	27,15,333	36,59,318	1,06,92,095
Ceylon..	2,80,740	1,90,382	1,64,414
Japan..	3,33,569	5,44,314	4,24,447
United States of America..	4,52,933	6,66,180	10,55,382
Other countries..	1,58,243	1,60,319	5,01,671
LIQUORS—			
Ale and beer—			
From United Kingdom..	18,74,801	29,38,320	71,16,368
Holland..	6,686	2,51,507	4,78,767
Japan..	36,93,084	34,02,322	7,40,255
Other countries..	6,03,516	7,16,163	8,46,374
Stout and porter—			
From United Kingdom..	7,22,325	4,59,444	8,98,951
Total of ale, beer and porter—			
From United Kingdom..	25,97,126	33,97,764	80,15,319
Holland..	6,686	2,51,507	4,79,050
Japan..	37,06,434	34,10,227	7,40,255
Other countries..	6,06,819	7,20,874	8,52,124
Cider and other fermented liquors..	53,109	64,444	1,08,454
Spirit—			
Brandy..	53,63,556	41,32,329	84,83,323
Rum..	4,45,231	4,93,096	5,05,104
Whisky..	1,02,79,202	95,45,234	1,24,79,242
Others..	59,47,699	67,75,448	1,01,15,859
Total of Spirit—			
From United Kingdom..	1,53,75,687	1,45,84,630	2,03,01,765
France..	40,65,753	36,26,791	77,02,989
United States of America..	10,54,989	11,62,191	12,44,431
Other countries..	15,39,259	15,72,495	23,34,343
MACHINERY AND MILLWORK—			
Prime-movers (other than electrical)..	25,01,243	70,85,898	2,44,87,649
Electrical—			
Control and switch gear..			6,42,092
Generators, alternators, and dynamos..	2,29,487	25,22,290	45,05,544
Motors..	11,52,674	34,38,726	61,37,724
Transformers..		2,60,751	4,34,271
Turbo-generating sets..			8,91,240
Other sorts..	25,24,701	61,85,041	92,74,999
Total of Electrical Machinery—			
From United Kingdom..	20,00,663	56,39,472	1,49,04,739
United States of America..	16,35,784	65,29,928	66,58,431
Other countries..	2,70,415	2,37,408	3,22,700

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
MACHINERY AND MILLWORK—Con.			
Machinery, <i>not being</i> prime-movers or electrical machinery—			
Boilers...	22,69,917	51,44,113	1,58,74,133
Boot and shoe manufacturing machinery...	.....	.....	4,65,771
Leather tanning and curing machinery...	.....	.....	8,22,384
Machine tools...	.....	.....	1,38,23,386
Mining machinery...	10,92,110	15,57,465	29,76,185
Oil crushing and refining machinery...	4,93,791	12,08,586	7,74,771
Paper-mill machinery...	6,11,962	9,77,758	31,91,268
Rice and flour mill machinery...	7,28,206	11,82,648	55,48,325
Saw-mill and wood-working machinery...	4,88,537	7,64,134	18,24,745
Sewing and knitting machines and parts thereof...	27,64,986	54,63,773	68,05,786
Sugar machinery...	1,24,865	4,32,587	17,55,315
Tea machinery...	15,07,609	22,34,421	39,10,746
Textile machinery—			
Cotton—			
Spinning machinery...			1,50,88,507
Weaving...			1,50,46,765
Bleaching and dyeing machinery...	1,65,32,213	1,30,76,264	5,42,123
Printing machinery...			29,692
Other sorts...			60,31,445
Jute...	57,06,036	1,47,76,991	2,77,67,314
Shuttles (<i>excluding</i> those for sewing machines)...	.....	9,21,460	14,30,606
Other sorts...	6,97,591	4,72,565	13,39,766
Typewriters...	11,83,449	18,11,683	36,33,141
Typewriter parts of and accessories...	2,53,073	2,83,380	3,56,052
Other sorts...	91,71,509	2,03,81,415	4,83,62,936
Total of Machinery and Milling—			
From United Kingdom...	3,20,80,841	5,91,59,123	17,52,17,862
Switzerland...	5,21,703	5,86,079	2,74,908
Japan...	24,62,921	8,45,809	12,11,515
United States of America...	1,39,24,489	2,79,83,704	4,02,52,112
Other countries...	10,44,005	16,07,184	68,18,784
METALS AND ORES—			
Aluminium—			
Unwrought (ingots, blocks, bars)...	14,70,283	6,55,320	16,47,726
Wrought—			
Circles...	7,59,234	17,70,153	{ 49,67,308
Sheets...			{ 13,06,841
Other manufactures...	8,669	1,09,509	8,43,537
Antifriction metal...	.....	2,04,255	2,53,441
Brass, Bronze and similar alloys—			
Unwrought...	10,38,993	49,11,310	38,79,035
Wrought—			
Mixed or yellow metal for sheathing—			
From United Kingdom...	100,374	1,08,94,490	2,42,92,218
Japan...	4,92,725	2,84,223	15,86,706
Other countries...	21,998	2,23,696	45,53,517
Other sorts...	82,57,302	67,40,406	88,88,919
Iron—			
Ore...	.....	.....	2,062
Pig...	11,228	5,29,269	15,40,174
Manufactures (III. K)—			
Angle, bolt, and rod...	5,63,616	3,48,354	4,79,439
Bars and channel—			
From United Kingdom...	7,96,203	19,48,805	42,43,193
Sweden...	40,448	2,54,688	5,99,450
United States of America...	21,89,119	11,67,385	3,40,916
Other countries...	2,63,998	5,42,257	17,58,333
Rice bowls ...	1,38,783	2,03,240	6,06,830
Iron or steel—			
Anchors and cables...	2,28,031	5,14,500	11,36,183
Beams, pillars, girders, and bridgework—			
From United Kingdom ...	1,85,192	44,85,872	2,29,63,096
United States of America...	1,58,877	6,39,072	28,02,690
Other countries...	93,203	13,313	28,51,779

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
METALS AND ORES—Con.			
Bolts and nuts—			
From United Kingdom	4,71,244	13,83,975	53,25,977
Japan	12,79,834	1,23,414	15,249
United States of America	17,17,787	10,02,207	10,98,401
Other countries	19,254	.65,256	4,69,918
Hoops and strips—			
From United Kingdom	70,51,157	62,15,001	84,87,626
United States of America	58,79,230	47,91,816	12,10,916
Other countries	3,62,409	1,18,433	2,54,837
Nails, rivets, and washers (<i>other than wire nails</i>)—			
From United Kingdom	14,53,501	20,13,891	45,25,969
Sweden	20,43,490	4,43,509	14,55,559
Norway	20,17,413	4,76,508	11,57,445
Belgium		22,859	5,51,325
Straits Settlements (<i>including Labuan</i>)	4,55,992	14,614	5,022
China	13,62,766	112	.....
Japan	16,09,171	48,386	1,40,833
United States of America	75,27,507	14,12,118	7,29,519
Other countries	17,283	52,017	2,91,992
Old for re-manufacture	2,79,215	3,90,215	6,16,777
Pipes and fittings, cast—			
From United Kingdom	16,35,997	22,48,423	78,08,635
United States of America	10,98,406	11,00,654	24,84,531
Other countries	99,224	22,509	1,97,485
Rails, chairs, and fishplates (<i>excluding those for railways</i>)	1,14,329	16,08,390	64,89,409
Screws	33,72,668	18,09,510	24,23,330
Sheets and plates—			
Galvanized—			
Corrugated	19,19,423	{ 1,94,10,447	2,57,20,160
Plain		{ 36,13,149	47,28,132
From United Kingdom	8,54,066	2,17,38,025	2,75,27,705
Japan	3,03,618	.....	.....
United States of America	6,14,887	12,50,945	28,52,208
Other countries	1,46,852	34,626	68,379
Tubes, pipes, and fittings, wrought—			
From United Kingdom	41,31,285	62,44,398	1,67,55,026
Japan	2,73,975	85	1,509
United States of America	38,82,045	1,16,63,384	1,28,56,283
Other countries	33,399	46,868	9,83,529
Wire—			
Fencing wire	51,15,427	{ 3,16,643	5,80,758
Other wire		{ 26,07,830	29,60,611
Wire nails—			
From United Kingdom		1,86,628	10,91,754
United States of America		29,14,812	16,04,798
Other countries		1,48,728	28,32,088
Wire rope—			
Galvanized	49,52,727	{ 11,40,253	12,56,063
Black		{ 18,81,138	22,84,299
Other manufactures	13,01,031	52,90,862	2,01,81,963
Steel—			
Angle	78,14,336	{ 39,74,501	86,57,057
Spring		{ 12,63,747	11,88,718
Bars	1,84,32,261	{ 2,11,11,137	4,50,00,662
Channel		7,66,226	22,02,443
Total of Bars and Channels—			
From United Kingdom	9,92,136	74,05,552	2,49,51,528
China	16,24,397	90,723	.....
Japan	44,43,118	7,33,985	48,780
United States of America	1,11,46,013	1,08,48,326	46,79,229
Other countries	2,26,597	27,98,777	1,75,23,568
Cast—			
Tool steel—			
High speed			{ 8,09,305
Carbon	9,39,092	18,58,329	{ 11,52,470
Cast steel bars			{ 18,10,123
Other cast steel			{ 5,85,174

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
METALS AND ORES—Con.			
Lead—			
Unwrought—			
Ore..	36,790	4,09,988	6,43,785
Pig..	1,83,612	3,02,062	2,23,621
Other sorts..	46,739	27,042	1,46,234
Wrought—			
Sheets, pipes, and tubes..	8,24,221	6,19,428	7,90,992
Sheets for tea-chests—			
From United Kingdom..	15,65,870	5,98,047	8,50,722
Ceylon..	13,89,538	3,85,341	1,97,134
Japan..	1,21,994	14,045	.....
Other countries..	1,23,835	.....	.....
MOTOR CARS, MOTOR CYCLES, AND MOTOR WAGONS, AND PARTS THEREOF—			
Motor Cars—			
From United Kingdom..	1,54,281	27,49,113	2,13,39,911
France .. . . . .	.....	12,690	14,49,366
Italy..	6,500	79,110	16,57,032
Canada.. . . . .	.....	38,025	61,25,580
United States of America..	8,41,398	2,30,65,932	4,50,73,580
Other countries..	39,030	3,16,523	25,88,488
Motor Cycles—			
From United Kingdom..	63,710	9,25,678	40,03,992
United States of America..	7,982	7,17,294	11,87,394
Other countries..	28,680	42,711	1,58,624
Motor wagons..	65,820	48,35,095	2,23,43,188
Parts and accessories..	26,81,528	65,02,264	1,75,15,382
OL-CLOTH AND FLOOR-CLOTH..	10,33,626	7,06,037	28,48,891
PACKING-ENGINE AND BOILER—OF ALL KINDS..	10,92,392	9,73,215	5,46,918
PAINTS AND PAINTERS' MATERIALS—			
Paints and Colours—			
Barytes.. . . . .	.....	.....	64,094
Graphite..	88,265	79,097	1,51,096
Red lead—			
Genuine dry.. . . . .	.....	10,37,310	7,82,854
Reduced dry.. . . . .	.....	26,002	63,323
White lead—			
Genuine dry..	31,11,076	4,24,171	4,19,375
Reduced dry.. . . . .	.....	12,871	13,968
Genuine moist.. . . . .	.....	9,22,007	11,06,075
Reduced moist.. . . . .	.....	53,403	1,27,800
Zinc, white—			
Genuine dry.. . . . .	.....	1,70,360	1,50,603
Reduced dry.. . . . .	.....	21,724	30,236
Genuine moist.. . . . .	.....	7,41,800	10,92,587
Reduced moist.. . . . .	.....	1,74,430	4,28,098
Blue paint or Paris blue.. . . . .	.....	49,505	3,08,018
Enamels prepared.. . . . .	.....	.....	7,31,835
Other sorts..	79,89,145	59,55,626	97,77,031
Total of Paints and Colours—			
From United Kingdom..	38,81,034	73,52,612	1,26,36,390
Japan..	49,17,755	7,90,723	2,30,838
United States of America..	20,34,544	8,73,985	13,94,909
Other countries..	3,55,153	6,50,986	9,84,856
PAINTERS' MATERIALS (OTHER THAN PAINTS AND COLOURS)—			
Turpentine—			
Genuine turpentine..	3,22,359	4,23,452	6,03,442
Reduced turpentine.. . . . .	.....	97,585	83,050
Varnish..	11,70,597	22,85,648	30,70,056
Other kinds.. . . . .	.....	5,96,415	5,18,116
PAPER AND PASTEBOARD—			
Paper—			
Printing paper—			
From United Kingdom	8,57,141	17,57,030	1,16,12,299
Sweden..	7,58,489	6,35,490	39,54,131
Norway..	41,38,910	19,79,294	76,08,673
Japan..	7,50,419	51,204	10,33,062
United States of America..	25,40,995	18,71,149	16,48,833
Other countries..	15,270	61,742	26,32,888

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
PAPER AND PASTEBOARD—Con.			
Writing paper and envelopes—			
From United Kingdom	17,98,174	23,64,069	1,11,22,133
Norway	3,13,792	5,89,585	26,94,078
Japan	10,56,472	1,53,617	9,50,742
United States of America	16,77,810	13,01,602	28,97,187
Other countries	55,104	81,501	26,96,730
Other kinds of paper	73,56,279	75,15,119	1,55,07,726
Paper manufactures	30,56,000	20,96,844	40,48,395
Pasteboard millboard, and cardboard of all kinds	28,31,823	29,87,462	46,27,398
Papermaking materials	11,13,171	15,83,824	49,91,000
POLISHES—			
Leather polish	7,32,151	14,85,505	32,15,351
Metal polish	6,78,893	6,49,987	9,33,989
Wood polish . . . . .	.....	.....	1,02,537
PROVISIONS AND OILMAN'S STORES—			
Bacon and hams	9,19,817	17,49,900	14,52,417
Biscuits and cakes	4,66,088	39,68,399	46,94,818
Butter	31,594	1,48,621	3,39,982
Cheese (including canned)	6,15,482	8,56,545	18,84,324
Cocoa and chocolate	8,40,541	12,42,611	14,30,822
Farinaceous and patent foods	51,28,787	63,33,032	70,94,760
Ghi	10,206	5,77,204	4,81,198
Isinglass . . . . .	.....	1,90,068	1,11,839
Jams and jellies	8,66,492	3,00,229	11,27,044
Milk, condensed and preserved (including milk cream)	28,09,597	40,18,941	44,82,368
Pickles, chutneys, sauces and condiments	6,46,640	5,78,559	7,79,271
Canned and bottled provisions (excluding tinned fish and canned or bottled fruits)	61,06,030	72,82,631	83,78,672
Tinned or canned fish . . . . .	.....	10,13,187	16,69,739
Canned or bottled fruit . . . . .	.....	.....	11,70,864
Others (including all the unspecified articles)	9,39,843	8,31,166	10,50,591
TOTAL OF PROVISIONS—			
From United Kingdom	33,18,090	1,15,44,552	1,78,99,431
Holland	39,863	5,41,555	11,83,538
Ceylon	1,80,360	3,00,111	1,94,915
Straits Settlements (including Labuan)	40,92,025	52,95,502	41,98,464
China	7,55,235	6,57,083	5,42,022
Australia (including New Zealand)	38,75,292	26,88,363	22,50,299
Japan	4,81,311	5,13,907	3,86,610
United States of America	61,91,739	62,46,113	71,24,615
Other countries	4,47,202	13,03,907	23,18,815
RAILWAY PLANT AND ROLLING STOCK—			
Carriages and wagons and parts thereof	70,76,603	3,00,50,013	6,54,43,127
Locomotive engines and tenders and parts thereof	30,57,238	42,98,378	4,33,20,792
Materials for construction—			
Bridgework—			
From United Kingdom . . . . .	.....	3,97,534	23,01,271
Rails, chairs, and fish-plates of steel or iron	41,656	72,00,560	1,29,07,375
Sleepers and keys of steel or iron . . . . .	.....	18,92,812	77,62,311
Sleepers of wood . . . . .	.....	1,09,169	48,09,053
Other kinds	2,59,382	19,24,284	47,61,032
TOTAL OF RAILWAY PLANT, ETC.—			
From United Kingdom	96,24,471	4,09,31,365	13,47,81,856
Japan	4,14,829	5,19,883	1,61,218
United States of America	3,83,488	42,09,894	22,34,383
Other countries	12,091	2,11,608	41,27,504
RUBBER—			
Manufactures—			
Tires for motor cars and motor cycles—			
From United Kingdom	34,24,293	34,77,695	34,86,538
France	8,32,054	14,28,105	14,78,514
Italy	2,27,180	9,84,124	43,59,035
Ceylon	78,658	50,369	85,585
Japan	12,160	10,361	.....
United States of America	11,41,571	30,25,833	37,33,850
Other countries	62,150	4,46,007	9,16,652
Tubes for motor tires	11,06,442	20,18,018	28,99,090
Other manufactures (except apparel and boots and shoes)	54,84,091	52,19,151	82,43,074

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19	1919-20	1920-21
	Rs.	Rs.	Rs.
SALT—			
From United Kingdom	24,04,268	39,13,640	35,85,379
Spain	8,90,100	29,95,106	24,79,305
Aden and Dependencies	58,52,354	60,41,355	67,52,872
Egypt	1,17,77,910	55,15,153	44,34,104
Italian East Africa	23,57,994	24,61,961	18,64,721
Other countries	27,638	25,178	36,97,075
SHIPS, PARTS OF (including launches and boats)	20,50,316	29,48,364	22,20,458
STARCH AND FARINA	9,37,656	30,67,453	16,64,186
STATIONERY (excluding paper)—			
From United Kingdom	46,72,297	46,96,238	1,26,69,970
Japan	13,77,143	13,38,883	14,23,621
United States of America	7,52,133	15,97,206	27,72,333
Other countries	• 1,95,130	1,92,931	13,48,623
STICKS AND WHIPS	90,651	1,05,053	1,79,054
Confectionery	5,58,107	21,25,043	39,35,815
Saccharin	15,065	4,45,696	7,44,268
TEXTILES—			
Hosiery—			
Underwear	87,27,526	1,45,04,692	{ 1,08,94,185
Other sorts			81,93,939
Total of Hosiery—			
From United Kingdom	9,15,603	6,76,701	17,83,338
Japan	73,59,251	1,22,39,030	1,39,30,738
United States of America	1,09,674	6,50,745	21,89,358
Other countries	3,42,998	9,38,216	11,84,690
Piece goods—			
Grey (unbleached)—			
Total Plain Grey	23,59,41,516	{ 8,67,44,509	13,93,73,203
Total Bordered Grey		{ 13,84,33,336	12,51,46,891
Total of Grey (unbleached)—			
From United Kingdom	14,51,54,407	19,23,93,168	18,73,10,380
China	59,152	52,860	3,66,027
Japan	9,00,33,559	2,90,00,244	7,17,30,642
United States of America	2,30,992	35,27,574	50,07,680
Other countries	4,63,406	2,03,999	1,05,365
White (bleached)—			
From United Kingdom	12,50,41,643	15,30,22,679	20,87,89,973
Holland	59,748	29,33,023	40,58,692
Switzerland	24,171	5,73,797	28,17,095
Japan	54,00,701	15,29,564	22,49,446
East African Protectorate	64,139	2,42,578	18,972
United States of America	2,67,079	81,529	2,06,984
Other countries	4,47,224	12,50,199	8,08,991
Coloured, printed, or dyed—			
Total Printed goods		{ 5,96,61,896	16,08,11,629
Total dyed goods	11,81,94,598	{ 4,01,67,587	11,54,03,101
Total Woven Coloured goods		{ 2,76,71,895	6,94,69,219
Total of coloured, printed, or dyed—			
From United Kingdom	10,26,31,192	11,22,10,350	30,53,65,265
Holland	6,61,089	27,75,454	79,34,107
Belgium		91,033	52,73,837
France	1,41,238	29,723	1,56,967
Switzerland	4,52,954	10,35,769	24,97,935
Italy	16,74,379	16,19,796	1,23,72,455
Straits Settlements (including Labuan)	1,94,799	10,69,474	3,82,722
Japan	1,09,73,879	63,32,771	97,16,140
United States of America	11,55,895	3,87,895	6,95,321
Other countries	3,09,173	19,49,113	12,89,200
Thread, sewing—			
From United Kingdom	52,80,657	44,75,396	84,61,735
Japan	5,29,975	3,78,489	1,12,657
Other countries	25,425	1,01,592	5,45,294
Other sorts	61,85,455	83,98,728	1,47,11,791
Share of each Province in the imports of Cotton Manufactures, including twist and yarn—			
Bengal	23,47,29,167	28,22,98,508	27,17,01,665
Bombay	23,58,52,484	15,58,98,824	33,85,82,618
Sind	6,44,68,102	7,77,94,938	16,92,80,180
Madras	4,22,96,062	3,73,16,667	6,34,14,613
Burma	2,82,02,251	3,75,73,958	7,82,21,214

SUMMARY OF IMPORTS INTO INDIA, 1919-21—Continued

Principal Articles	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
Wool—			
Manufactures—			
Yarn and knitting wool...	18,23,940	5,94,490	24,73,427
Blankets...			6,26,803
Braids...	3,915	27,629	68,371
Hosiery...	14,08,226	6,27,396	32,04,903
Piece goods—			
From United Kingdom...	1,57,03,566	1,19,03,191	4,11,86,984
Japan...	15,33,141	4,72,345	20,15,526
Other countries...	2,88,019	2,91,952	29,15,291
TOILET REQUISITES...	39,56,332	40,20,952	54,49,854
TOYS AND REQUISITES FOR GAMES AND SPORTS (including FISHING TACKLE)...	35,14,856	52,44,237	59,09,752
UMBRELLAS AND UMBRELLA FITTINGS—			
Umbrellas—			
From United Kingdom...	5,02,304	4,05,312	15,06,987
Japan...	1,26,029	2,00,644	1,75,151
Other countries...	1,43,353	1,01,586	2,39,263
Umbrella fittings...	9,43,362	13,31,389	20,34,843
WOOD AND TIMBER—			
Timber...	64,77,261	1,22,63,256	1,01,94,116
Wood—			
Firewood...	15,400	27,512	1,22,884
Manufactures of wood, other than furniture and cabinet ware...	30,94,516	32,62,135	41,11,543

EXPORTS BY MAIN CLASSES OF INDIAN MERCHANDISE, 1919-21

I. FOOD, DRINK AND TOBACCO—	Twelve months, 1st April to 31st March			Increase (+) or Decrease (-) in 1920-21 as compared with 1919-20	Increase (+) or Decrease (-) in 1920-21 as compared with 1918-19
	1918-19	1919-20	1920-21	R	R
A. Fish (excluding canned fish)...	44,09,687	50,51,501	56,02,338	+5,50,837	+11,92,651
B. Fruits and Vegetables.....	60,21,503	62,73,685	60,34,460	-2,39,225	+12,957
C. Grain, pulse and flour.....	40,07,13,124	15,14,57,250	25,64,09,695	+10,49,52,445	-14,43,03,429
D. Liquors.....	4,883	10,727	27,527	+16,800	+22,644
E. Provisions and oilman's stores.....	61,80,391	61,74,110	74,17,680	+12,43,570	+12,37,289
F. Spices.....	1,09,33,017	1,57,17,398	83,31,710	-73,85,685	-26,01,307
G. Sugar.....	48,50,473	53,91,798	95,47,993	+41,56,195	+46,97,520
H. Tea.....	17,77,57,776	20,56,50,470	12,16,43,616	-8,40,06,854	-5,61,14,160
I. Other food and drink.....	1,21,32,264	1,72,94,146	1,42,99,173	-29,94,973	+21,66,909
J. Tobacco.....	96,35,833	92,62,202	74,92,272	-17,69,930	-21,43,561
Total, Class I.....	63,26,38,951	42,22,83,287	43,68,06,464	+1,45,23,177	-19,58,32,487
II. RAW MATERIALS AND PRODUCE AND ARTICLES MAINLY UNMANUFACTURED—					
A. Coal, coke and patent fuel.....	15,63,114	82,67,569	1,50,27,880	+67,60,311	+1,34,64,766
B. Gums, resins and lac.....	3,07,38,369	7,41,98,127	7,68,37,384	+26,39,257	+4,60,99,015
C. Hides and skins, raw.....	9,34,23,402	23,40,62,210	5,24,84,457	-18,15,77,753	-4,09,38,945
D. Metallic ores and scrap metal for re-manufacture.....	2,14,86,511	1,50,37,504	2,46,60,264	+96,22,760	+31,73,753
E. Oils.....	3,51,43,214	3,22,24,893	1,77,80,550	-1,44,44,313	-1,73,62,634
F. Seeds.....	11,21,83,612	26,26,90,198	16,83,47,923	-9,43,42,275	+5,61,64,311
G. Tallow, stearine and wax.....	7,79,943	9,918,827	10,81,296	+1,62,469	+3,01,353
H. Textile materials.....	51,28,99,871	90,66,23,437	62,01,22,911	-28,65,00,526	+10,72,23,040
I. Wood and timber.....	65,72,173	1,42,08,923	1,23,64,706	-18,44,217	+57,92,533
J. Miscellaneous.....	4,61,57,743	5,00,84,777	4,55,68,294	-45,16,483	-5,89,449
Total, Class II.....	86,09,47,952	1,59,83,16,465	1,03,42,75,695	-56,40,40,770	+17,33,27,743

EXPORTS BY MAIN CLASSES OF INDIAN MERCHANDISE, 1919-21—Concluded

Twelve months, April 1 to March 31			Increase (+)	Increase (+)
			or	or
			Decrease (-)	Decrease (-)
			in 1920-21	in 1920-21
	1918-19	1919-20	1920-21	as compared with 1919-20
	R	R	R	R

III. ARTICLES WHOLLY OR MAINLY MANUFACTURED—

	1918-19	1919-20	1920-21	as compared with 1919-20	as compared with 1918-19	R
A. Apparel	16,80,225	27,45,980	30,33,472	+2,87,492	+13,53,247	
B. Arms, ammunition and military stores	1,330	102	786	+384	-544	
C. Carriages and carts, <i>including</i> cycles and motor-cars	57,152	51,370	27,491	-23,879	-29,661	
D. Chemicals, drugs and medicines	4,61,45,222	3,03,51,290	3,78,57,067	+75,05,777	-82,88,155	
E. Cutlery, hardware, implements (<i>except</i> machine tools), and instruments	3,21,676	7,66,252	10,08,899	+2,42,647	+6,87,223	
F. Dyes and colours	2,06,02,177	2,66,14,551	1,10,85,653	-1,55,28,898	-95,16,524	
G. Furniture, cabinetware and manufactures of wood	7,87,664	11,73,307	9,42,640	-20,667	+1,54,976	
H. Glassware and earthenware	87,319	2,59,892	2,19,978	-39,914	+1,32,659	
I. Hides and skins, tanned or dressed, and leather	9,69,91,387	12,71,48,279	3,29,53,345	-9,41,94,934	-6,40,38,042	
J. Machinery of all kinds, <i>including</i> belting for machinery	1,28,802	1,68,726	35,272	-1,33,454	-93,530	
K. Metals, iron and Steel and manufactures thereof	13,09,118	46,81,973	59,43,793	+12,61,820	+46,34,675	
L. Metals, other than iron and steel, and manufactures thereof	87,66,563	58,07,432	1,19,02,308	+60,94,876	+31,35,745	
M. Paper, pasteboard and stationery	3,85,904	3,56,264	1,87,739	-1,68,525	-1,98,165	
N. Railway plant and rolling-stock	2,55,436	2,88,128	11,34,426	+8,46,298	+8,78,990	
O. Yarns and textile fabrics	67,03,87,674	78,18,99,046	72,18,18,509	-6,00,80,537	+5,14,50,85	
P. Miscellaneous	3,11,72,562	5,01,47,166	4,09,56,914	-91,90,252	+97,84,352	
Total, Class III	87,90,60,211	103,24,59,758	86,91,08,292	-16,33,51,466	-99,51,919	

IV. MISCELLANEOUS AND UNCLASSIFIED

Total	2,06,03,382	3,70,91,664	4,29,20,479	+58,28,815	+2,23,17,097
	2,39,32,50,496	3,09,01,51,174	2,38,31,10,930	-70,70,40,244	-1,01,39,566

VALUE OF TRADE IN MERCHANDISE ONLY, WITH THE BRITISH EMPIRE AND FOREIGN COUNTRIES (IN THOUSANDS OF £ STERLING), 1913-14, 1919-20

A.—Imports

Countries	1913-14 £ (1,000)	1919-20 £ (1,000)
British Empire—		
United Kingdom	78,388	104,933
Straits Settlements	2,282	5,934
Australia	611	3,244
Hong Kong	655	2,747
Ceylon	539	2,512
East African Protectorate (<i>including</i> Zanzibar and Pemba)	259	1,667
Egypt (a)	.....	1,386
Mauritius	1,685	1,282
Aden and Dependencies	292	1,020
Other countries of the British Empire	666	681
Total British Empire	85,377	125,456

Foreign Countries—

United States of America	3,193	25,267
Java	7,163	19,639
Japan	3,187	19,153
China	1,137	3,833
Persia	475	2,299
Dutch Borneo	598	1,892
France	1,794	1,769
Italy	1,464	1,369
Holland	1,035	991
Turkey, Asiatic	379	839
Siam	185	824
Switzerland	458	796
Belgium	2,838	698
Sweden	344	566
Arabia	383	542
Norway	155	477

VALUE OF TRADE IN MERCHANDISE ONLY, ETC.—*Concluded**A.—Imports—Con.*

Foreign Countries— <i>Con.</i>	Countries	1913-14 £(1,000)	1919-20 £(1,000)
Russia...	39	153	
Austria-Hungary...	2,860	127	
Germany...	8,444	43	
Egypt...	200	...	
Other countries...	457	1,239	
Total Foreign Countries...	36,788	82,516	
Grand total...	122,165	207,972	

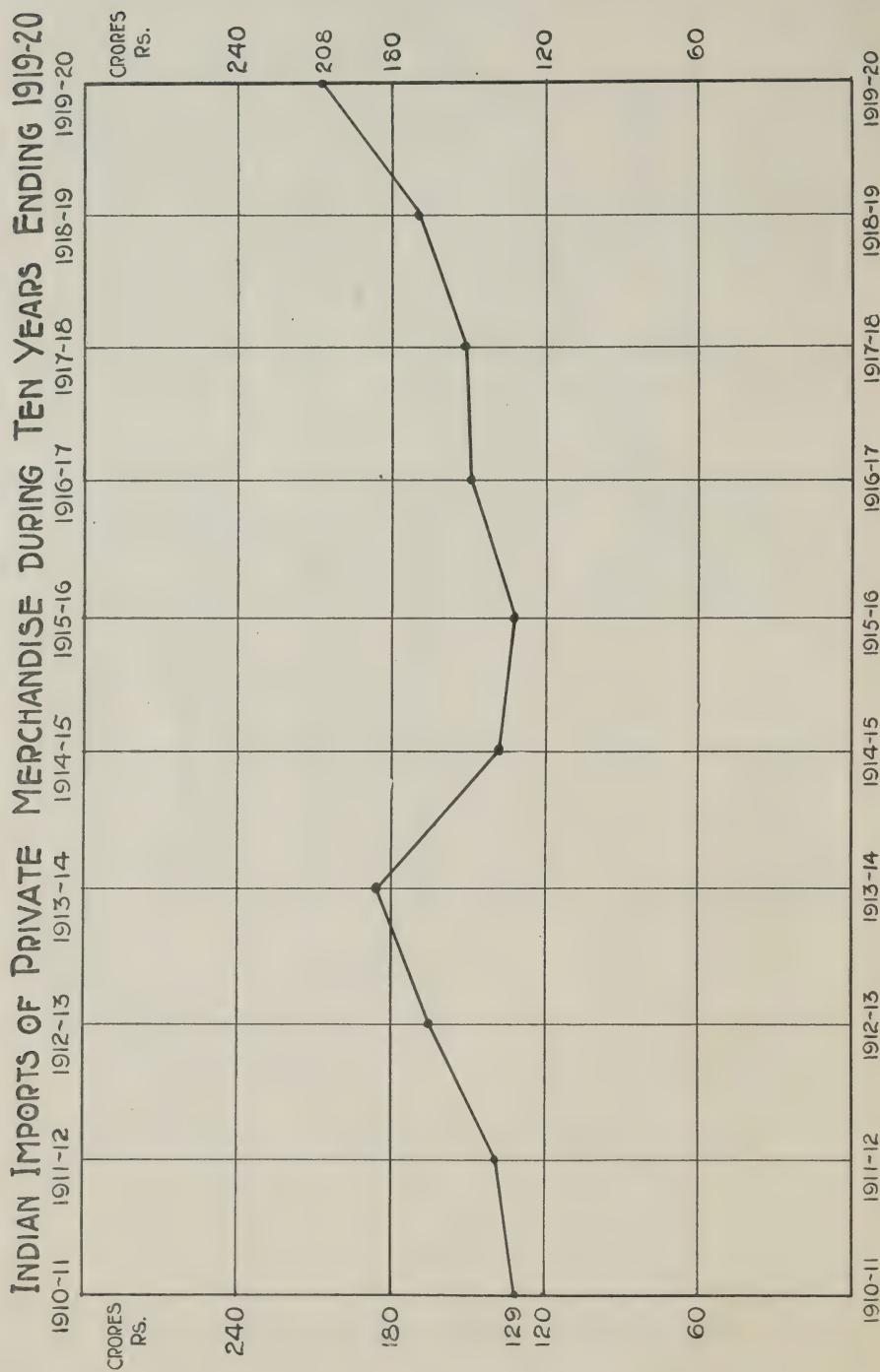
B.—Exports (Including Re-Exports)

British Empire—			
United Kingdom	38,902	96,738	
Egypt (a)...	...	3,805	
Ceylon...	6,026	11,251	
Straits Settlements...	4,524	7,580	
Australia...	2,732	3,400	
Hong Kong...	5,214	9,101	
Canada...	952	1,693	
Aden and Dependencies...	931	3,223	
East African Protectorate (including Zanzibar and Pemba)...	678	1,817	
Other countries of the British Empire...	2,969	5,680	
Total British Empire...	62,928	144,288	
Foreign Countries—			
United States of America...	14,567	48,782	
Japan...	15,130	46,863	
France...	11,813	15,882	
Italy...	5,262	7,877	
Persia...	938	5,288	
China...	3,809	11,014	
Turkey, Asiatic...	1,957	8,747	
Java...	1,297	2,004	
Cuba...	372	1,957	
Argentine Republic...	2,090	6,380	
Indo-China...	510	1,090	
Chile...	709	867	
Spain...	1,486	2,357	
Russia...	1,650	1	
Holland...	2,944	1,641	
Belgium...	8,064	10,102	
Egypt (a)...	1,512	...	
Germany...	17,613	1,387	
Austria-Hungary...	6,674	366	
Other countries...	4,594	9,900	
Total Foreign Countries...	102,991	182,505	
Grand total...	165,919	326,793	

(a) Prior to 1915-16 Egypt was included as a foreign country.

IMPORTS AND EXPORTS OF CERTAIN PRINCIPAL ARTICLES FROM AND TO THE BRITISH EMPIRE AND FOREIGN COUNTRIES DURING THE PRE-WAR YEAR (1913-14) AND 1919-20

Imports	British Empire		Foreign Countries	
	1913-14 R (lakhs)	1919-20 R (lakhs)	1913-14 R (lakhs)	1919-20 R (lakhs)
Cotton manufactures, including				
twist and yarn..	59.85	51.38	6.45	7.70
Sugar..	2.89	3.46	12.07	19.53
Metals and ores..	14.69	15.49	7.38	7.28
Oils, mineral..	35	65	3.77	8.62
Machinery and millwork..	7.00	6.00	76	3.02
Silk raw..	26	26	1.00	1.51
Silk, manufactures..	54	1.03	2.56	4.89
Hardware..	2.29	2.14	1.66	2.23
Motor cars, etc..	1.10	77	43	3.16
Liquors..	1.42	2.17	97	1.20
Paper, etc..	90	96	69	1.39
Glass and glassware..	27	35	1.67	1.64
Drugs and medicines..	70	1.00	47	82
Chemicals..	76	1.24	25	37
Wool manufactures..	2.23	1.38	1.62	22
Apparel..	76	85	95	74
Exports				
Cotton, raw..	1.89	4.17	39.16	54.48
Cotton, manufactures..	6.50	13.34	5.62	14.07
Jute, raw..	11.76	13.31	19.06	11.39
Jute, manufactures..	7.13	12.71	21.15	37.31
Hides and skins, raw..	59	3.71	11.10	19.66
Hides and skins, tanned..	3.70	11.04	52	1.51
Seeds..	6.16	14.25	19.51	12.02
Rice not in the husk..	11.85	8.44	14.55	1.47
Wheat..	8.60	8	4.53	12
Tea..	12.34	19.25	2.64	1.31
Lac..	62	2.16	1.35	5.10
Wool, raw..	2.43	4.01	7	...
Oils..	53	2.47	45	75
Hemp, raw..	44	1.45	58	45
Coffee..	71	70	83	1.01
Rubber, raw..	78	1.46	1	23
Indigo..	6	30	15	1.03
Teakwood..	55	1.17	23	8
Coir..	32	79	59	25
Myrobalans..	22	60	35	42
Tobacco..	40	73	8	20
Mica..	28	74	18	12
Coal and coke..	60	72	9	11
Saltpetre..	26	46	5	9



THE DIRECTION OF INDIA'S FOREIGN TRADE

The latest available information regarding the condition of Indian trade is summarized in the following article, from *Capital*, November, 1921:—

"The first half of the financial year 1921-22 has shown a considerable decrease in the volume of India's seaborne foreign trade, as compared with the position last year. The grand total of imports, exports, and re-exports, in merchandise, amounted to Rs. 235 crores, as against Rs. 302 crores, a decrease of Rs. 67 crores or 22 per cent. The balance of trade calculated from the statistics of merchandise, treasure, Council Bills, and Enfaced Rupee Paper has been against India to the extent of Rs. 6,10 lakhs this half-year, as compared with Rs. 1,25 lakhs and Rs. 40,82 lakhs in favour of India in the corresponding period of 1920 and 1919, respectively. The trade returns of September, summarized last week, indicated the steady contraction of imports towards the normal, though in particular items the tendency did not correspond with the normal pre-war position. Thus articles wholly or mainly manufactured showed a heavy decrease of more than ten crores, the fall being due to smaller purchase by India of cotton piecegoods, iron and steel, motor cars and cycles. A better account was expected at the turn of the autumn. There was a demand, stronger than usual, of coal and raw cotton. The decreasing outturn of Indian collieries is responsible for our new dependence on foreign coal. The figures are interesting. In the first half-year of 1919-20, the coal imported to India was worth Rs. 4 lakhs, whereas in the half-year, just over, India bought coal from abroad to the tune of nearly Rs. 2 crores, of which about Rs. 54 lakhs came from the United Kingdom and Rs. 70 lakhs from Natal. Generally speaking, the directions of trade after the war are still unsettled. In the first six months of the current year, India's import trade amounted to Rs. 124 crores of which the British Empire shared Rs. 78 crores. Germany has doubled her hold since last year, her half-year's share in the import trade having come to Rs. 280 lakhs. September's imports from Japan come barely to Rs. 75 lakhs, out of a total from non-Empire countries of Rs. 7 crores. Next to the United Kingdom, which in September placed about Rs. 10 crores worth of goods on the Indian market, Java figures as the highest shipper (Rs. 212 lakhs), India having bought Rs. 221 lakhs worth of foreign sugar last September. Advertising again to the hold of Japan on India's import trade, there is evidence of its weakening. In 1919-20 Japan's share was 19.8, but in the next twelve months it was halved down to 9.2 per cent. The tendency of the last six months is in the same direction, since imports from Japan have been Rs. 8,20 lakhs in contrast with Rs. 14,61 lakhs of the corresponding period last year. The general restriction of import in recent months accounts partly for the diminution in figures, but the disparity indicated is striking when we recall that the gross half-yearly import for 1920 was Rs. 159 crores and Rs. 124 crores for the current period. The reduction of imports from the United States from Rs. 14 crores to Rs. 13 crores shows that her share has been maintained steadily in a falling market.

"Coming to half-yearly statistics of India's export trade, there has been in 1920-21 a fall by Rs. 28 crores, to Rs. 104 crores, of which, as usual, the larger part went to non-Empire countries which received Rs. 61 crores. The reduction of the share of the United Kingdom from Rs. 28 crores to Rs. 17 crores in the half-year is striking. The United States took raw materials and goods worth Rs. 12 crores in the period as against Rs. 20 crores of the corresponding period in 1920. Japan bought more than she did last year from us, but the most striking feature in export figures is the reappearance of Germany as a customer for our raw materials. From Rs. 326 lakhs of the earlier period, her accounts have risen to Rs. 6,68 lakhs in the half-year just over. Examining the shipments of raw jute we find that whereas the offtake of the United Kingdom fell from Rs. 198 lakhs to Rs. 42 lakhs in the six-month period, the purchase of Germany rose from Rs. 66 lakhs to Rs. 2,10 lakhs. But for the disastrous slump in the mark, the tendency should have persevered through October.

As regards tea, the presence of a blank against the name of Russia shows how far the trade is out of the normal. There is, however, some improvement to note. Whereas the export of black tea in September, 1920, was as low as Rs. 105 lakhs, the accounts for September, 1921, bring it to Rs. 194 lakhs. The figures for the six-month period are Rs. 5,14 lakhs and Rs. 6,37 lakhs respectively of which latter the United Kingdom took Rs. 5,30 lakhs. Raw cotton does not present many broad changes. The exports in September, 1920, were worth Rs. 203 lakhs, and in the half year Rs. 25 crores; the corresponding figures for 1921 are Rs. 3,40 lakhs and Rs. 22.5 crores, of which latter Japan, the best customer, has taken Rs. 14,21 lakhs or 149,940 tons. On the whole Japan has been figuring more steadily as a buyer and less as a seller in relation to India. The overtrading of importers last year has been arrested, and with a good busy season and a fair monsoon, the approach towards a credit position may be maintained. If foreign exchanges were less unstable, the outlook would have been happier."

CHAPTER VI

Railways, Ports and Rivers

THE ECONOMIC VALUE OF THE RAILWAYS

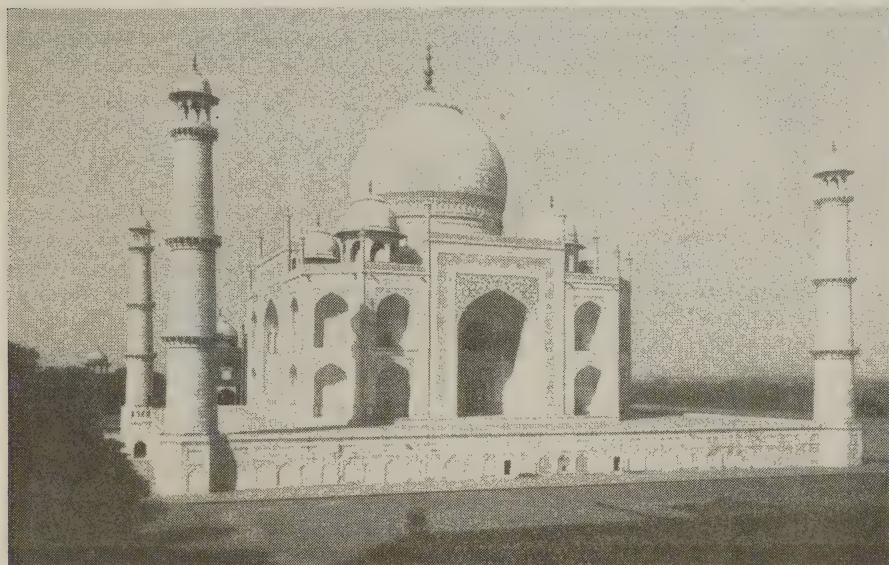
The construction of railways in India was commenced toward the middle of the last century. Owing to the energy and farsightedness of Lord Dalhousie, a scheme for the construction of about 5,000 miles of railways was projected and eventually materialized. Under this scheme the railways were divided up amongst some eight companies, with an aggregate guaranteed capital of about £50,000,000. These were the East Indian; the Great Indian Peninsula; the Bombay, Madras, Baroda and Central India; the Eastern Bengal; and several others. This was the origin of the present fine railway system, which serves the country to-day with a mileage of nearly 40,000.

It is perhaps unfortunate that among Indian railways there is such a variety of gauges. No doubt if the railways were to be reconstructed, in the light of present knowledge, they would be built to a standard gauge, with possibly the exception of the mountain railways. A little more than half of the present mileage is broad gauge, that is 5 feet 6 inches, and a little less than half of meter gauge, or 3 feet 3 $\frac{1}{2}$ inches. There is also some 3,000 miles of 2 feet 6-inch gauge, and about 700 miles of 2 feet gauge. According to the *Indian Year Book* the total mileage under construction was 1,803 in 1919, of which 618 were for broad gauge, 792 meter, 337 two foot six inches, and 57 for the two foot. The standardization of gauges has been carefully considered, but financial conditions have so far proved insuperable to the adoption of such a measure.

Distribution and Development.—The Indian railways radiate from the principal ports of Calcutta, Bombay, Madras, Karachi, Chittagong and Rangoon, and are, or in time will be, connected with all the more important cities in the country. There are many who feel that the development of railway communication in India has not been sufficiently rapid; but apparently the impediment to speedier construction has been the difficulty of finance. Under ordinary conditions the expansion of Indian railways will probably continue steadily, although it is possible that some time may elapse before they will become adequate for the country's needs.

Conditions of Concessions.—The original concessions for the building of railways carried a guarantee on the stock up to 5 per cent. and coupled with this, a free grant of all the necessary land. In return the companies were compelled to share their surplus profits with the Government, in the event of their exceeding the neces-

sary percentage. The railways were also bound to sell out their systems after a certain time to the Government, at rates specified, should the latter wish to take them over. Further, the companies had to consent to close supervision and control of their expenditure and management. The conditions imposed by Government should have been very favourable for the authorities, but the optimistic expectations held in the early days were not altogether realized, because of the excessive cost of construction. In this the experience of the Indian railways is somewhat analogous to that of the Grand Trunk in Canada.



Taj Mahal, Agra.

The work of construction was not particularly well performed, nor was the government able to render any very great assistance. Apparently the standard set in the early days was so high that it was quite impossible that a satisfactory dividend could be realized on the capital provided; even experimental lines were double tracked and equipped with heavy rails. Furthermore, it seemed to be the aim of the engineers to run the right-of-way in straight lines, in order to secure directness at the expense of traffic, for this procedure left to one side a number of small towns. This is a tendency which is not unfamiliar to the people of this continent.

Effect upon Trade.—The opening of the railways in India had a tremendous effect upon the trade and commerce of the country. Previously the total foreign commerce amounted to about 32 crores, and was fairly steady at that amount; but, even fifteen years after the opening up of railway facilities, this trade had more than doubled, in fact nearly trebled. This had a most beneficial effect upon the whole country, and although there had been a certain amount of direct financial loss in the construction of the railways, it was more than compensated for by the great advantage which such a superior means of transportation afforded the country.

The first railways were projected on a gauge of 5 feet 6 inches, costing £17,000 a mile to build. But at this rate of expenditure it was impossible to progress very rapidly. Consequently it was decided to investigate a more economical method, which led to the adoption of the metre gauge.

Indian Railways as an Investment.—The study of the Indian railways should not be without considerable interest to Canadian economists, as from a one-time liability,

they have now become a source of handsome profit. The turning-point between profit and loss seems to have been reached about the beginning of the present century, since which time, with certain fluctuations, the revenue has steadily increased, until about a year ago it has reached some £11,000,000. The provisions of the early contracts finally turned out to be very advantageous to the Government; for when they terminated the Government was enabled to purchase the railways or else re-lease them on more favourable terms than formerly. This advantage was to a certain extent offset by one of the provisions of the contract, which guaranteed the dividend at an exchange rate of 1s. 10d. to the rupee. The railway policy pursued by the Government of India in the past has been undoubtedly wise. Finally the Government will find itself in possession of a very fine system covering the whole country, providing transport at reasonable rates, and ensuring a handsome revenue to the State.

Two Classes of Railways.—It follows, then, that there are two classes of railways in India, the State railways, and the company-managed; which latter class maintains its boards of directors in London. These boards are represented in India by an official who is termed an "agent," corresponding to the general manager of a Canadian railway. The Indian Railway Board is represented on the Viceroy's Council by the Member in Charge of the Department of Commerce and Industry. This railway representation on the Council of India, effected during the regime of Lord Curzon, has proved of considerable importance and much to the advantage of the lines themselves. The opening up of fresh tracts of territory, by means of irrigation canals, has been of the greatest benefit to the railways, as it has provided an immense source of goods traffic. Owing to the construction of canals in the Punjab, the Government's system, the Northwestern, which connects the northern country with the port of Karachi, has particularly benefited. Where as formerly it was operated at a loss, it is now a most profitable undertaking.

Influence of Railways.—The railways of India play a very large part in the economic life of the country, as in addition to goods they also transport an immense number of passengers. It is interesting to read that in the early days the passenger traffic was little considered. Apparently at that time the promoters did not foresee the immense proportions to which this class of business would grow. The mere carrying of pilgrims from one part of the country to another is a very considerable source of revenue. One of the most important influences which the railways exert is that upon the character of the Indian people themselves. In the old days, the majority of the population remained in the towns and villages, seldom or never in the course of a lifetime travelling far from their homes. But the advent and development of the train service has effected an immense change. Now the people travel freely from one part of the country to another. Just as this development of transportation has affected other countries, so it will, in some measure at least, the people of India, no doubt leading to greater combination amongst the workers, the formation of new unions, and the strengthening of existing ones. As in Canada in the late summer, the lines permit the movement of agricultural labourers for the harvesting of crops. The part which the systems play in the alleviation of the effects of famine has already been touched upon.

At the end of the financial year 1919, the total capital outlay incurred by the Government in the purchase and construction of railway lines in India, including the liability which remains to be discharged by means of Annuity and Sinking Fund payments, amounted to £380,768,116. The total mileage up to the end of the same year was 36,735.

Lack of Rolling Stock.—At the present time, Indian lines are badly in need of equipment, and from all accounts the lack of rolling stock appears to be crippling the trade of the country. From conversations held with industrialists in India, it appears that great difficulty is found in securing enough wagons for immediate needs.

Apparently, as the Commerce and Industry Member of Council remarked at a meeting of the Agents of the Indian Railways in the latter part of 1920, lack of funds is responsible for the impossibility of making larger grants than those authorized. In view of this situation, and the fact that loans for Indian railways can be looked upon as reproductive in the best sense, it seems a pity that their expansion has to be so radically curtailed, at a time when the country is so urgently in need of trade.

There is no doubt that in the near future, very large sums of money must be expended, not only to increase rolling stock, but also to construct new lines, and to improve and strengthen those in use. One factor militating against a more profitable use of the railways is the impracticability of running heavy trains. Before these can be operated, it will be necessary to considerably strengthen the bridges, and also probably to improve the couplings, as those at present in use are not adapted for the strain that would be put upon them by a long train over steep grades. At the present time, the heaviest trains run in India are those of about 1,000 tons, although in certain parts this may be increased to about 1,400 tons.

The principal lines in India are given below with their approximate mileage:—

Bengal and Nagpur Railway	1,889
Great Indian Peninsula	2,562
East Indian Railway	2,459
Northwestern Railway	3,805
Bengal and Northwestern Railway	1,243
Bombay, Baroda and Central India	2,819
Burma Railways	1,535
Madras and Southern Mahratta	2,550
Oudh and Rohilkhand	1,512

PORTS AND TRADING CENTRES

India is not very fortunate in the matter of natural ports considering the extent of her seaboard, and her advantageous position for conducting foreign trade.

The ports proper are controlled by Port Trusts, the membership of which is partly maintained by nomination by the Government and partly by election. These bodies have authority to collect a revenue by levying charges on goods passing through their sheds, which funds are utilized in carrying on the work of the ports and in improving them.

In addition to the ports described below, there are a number of smaller ones, but as they have little connection with foreign trade, it has not been thought necessary to discuss them in detail.

The principal ports, however, are Calcutta, Bombay, Rangoon, Karachi, and Madras, and their importance runs more or less in the order in which they are given.

Calcutta

Calcutta is situated in latitude 22° 33' North, and longitude 93° 28' East, on the left bank of the river Hoogly, which belongs to the delta system of the Ganges. The population of the city, including Howrah, across the river (which is virtually a part of it), is about 1,300,000. Calcutta, which until 1911 was the Imperial capital, can rightly be considered the principal city of India, and is the cold weather seat of the Bengal Government.

This port serves the jute and tea industries, two of the most important of the country; and practically all coal exported is handled through it. A certain amount of wheat and various other commodities is also exported. It is well served by railways, as it is connected with other parts of the country by the East India, Bengal and Nagpur, Eastern Bengal, and some other railways. According to the latest figures available, the income of the port of Calcutta amounted to £1,055,945 and the expenditure to £1,041,957; the capital debt is a little over £7,000,000. In the year 1918-19 the total value of the trade passing in and out of Calcutta amounted to over £132,-

000,000, of which £56,000,000 was made up of imports and £76,000,000 of exports. To show how this port has grown, it may be said that in the year 1902-03 the imports were valued at £27,000,000 and the exports at £39,000,000, a total of £66,000,000, or less than half of what they were in the first year quoted. The port seems to be fairly well equipped for handling cargo, and has nine berths along a total river frontage of nearly 5,000 feet. The quays are equipped with fixed and derricking cranes, which have a capacity of up to 35 cwt. There is a fixed crane with a lifting capacity of 5 tons, and there is also one 30-ton Goliath transporter. Exports are handled at the Kidderpore docks, which has eighteen berths suitable for general produce, and ten confined to coal. The port is also equipped with dry docks suitable for the repair of ocean-going vessels, and there is a small dock for repairing river steamers. The year before the war the tonnage handled in the port of Calcutta amounted to some 5,000,000 tons.

Before the commencement of the war the Port Commissioners had under consideration large future development schemes which were investigated and reported upon by a Port Facilities Committee appointed for that purpose by the Government in December, 1913; but the intervention of the war necessitated the postponement of extension work. The latest advices, however, report that the King George dock, the construction of which was the scheme referred to, is to be undertaken at once. It is stated that when this dock is completed it will provide an area of about 200 acres, and that there will be 25,000 feet of quay wall and between thirty and forty berths. This dock will add immensely to the cargo-handling facilities of Calcutta, and will no doubt have a very favourable effect upon the prosperity of the city. It is expected that a section of the new dock will be available in the course of six or seven years.

Calcutta is exceedingly fortunate in its situation in the Gangetic Delta, which makes it the port of entry and shipping for a very rich part of Bengal. This city appears to be assured of its pre-eminent position in the trade of India. The one hundred and twenty miles which separate Calcutta from the ocean present a problem in navigation the difficulties of which are hardly exceeded in any other part of the world; and it is said that the pilot service of the Hoogly is second to none. The reason for these difficulties is the alluvial nature of the Ganges. It brings down large quantities of silt from the plains, deposits them at the mouth of the river, thus causing currents to vary and the river to shift its course. As a result close supervision is required. The Irrawaddy river presents the same problem, although perhaps in not so marked a degree as the Hoogly.

Bombay

Bombay, the western entrance to India, is situated on an island in latitude 18° 55' North, and longitude 52° 74' East. It is very finely placed, and is fortunate in having a magnificent harbour. According to official figures, the trade of this port in the year 1918-19 was about 210 crores. Over 4,500,000 tons of shipping entered and cleared. The total value of trade for the year stated reached £164,000,000, which as compared with earlier years shows a gradual but substantial growth.

Bombay is the principal port of shipment for raw and manufactured cotton, and for a certain amount of coal, hides, grain and manganese ore.

It was stated to the writer that Bombay had greatly grown in recent years, and that a good deal of development has been undertaken in connection with the port. This is to be still further extended, and a loan was recently floated for the purpose. Not only are improvements being undertaken in connection with the port itself, but plans have also been made to undertake a housing scheme—spread over a number of years and at a cost of about five to six crores of rupees—to accommodate something over fifty thousand tenants. Plans have also been considered to increase the supply of fresh water which at present is hardly sufficient for the needs of the city. Drainage

and sewage works are also to be put in hand. Bombay has all the makings of a very fine city, and with its favourable and beautiful situation could, one would think, be the finest in India. It has stately buildings, but much of the impression made by these is destroyed by the griminess of the streets. Bombay is like the rest of India, a study in contrasts, and one sees the most modern developments and at the same



Princes and Victoria Docks, Bombay.

time gas and oil lamps used for the lighting of some of the streets. That it is the gateway to Europe and North and South America is much in its favour; as is the fact that it is also the terminus for Indian mail steamers, the majority of the passenger traffic passing through it.

Rangoon

Rangoon, the capital of Burma, is situated about twenty-four miles from the sea, on the Rangoon river, which runs into the Irrawaddy. This affords it a water connection with the interior of the province. The port is fairly well equipped for loading and unloading vessels, but at the present time there is no dry-dock suitable for repairing ocean-going vessels.

The navigation of the Irrawaddy river between Rangoon and the ocean has given a great deal of trouble, and was only overcome when a river-draining scheme was designed to cope with it. This appears to be fairly satisfactory, and while navigation is still a cause for worry, it works on the whole quite well.

Karachi

Karachi gives the impression that for its size it is one of the best-equiped ports in India. It is of interest to read in connection with this port that Alexander the Great, some three hundred and twenty-five years before the Christian era, is said to have taken refuge in it from a storm in the Arabian sea.

The port has excellent facilities for loading and unloading, and a scheme is on foot to increase them still further. The quays have a length of some 8,600 feet, and

provide seventeen ship berths, all of which are completely served by the port railway. Most of the cranes have a capacity of 35 cwt., and there is also one 14-ton crane and one of 30 tons. In addition there is a bulk oil pier, one of the most modern in the East, from which petroleum is discharged direct into the tanks of the various companies. It is stated that the extension scheme will provide a new wharf, known as the "West Wharf," which on one side will provide accommodation for twelve or thirteen ships, and on the other for over twenty, although the latter will probably not be completed until demanded by traffic. Eventually therefore the berthing capacity will be trebled. This "West Wharf" will be constructed entirely on reclaimed ground, by means of a very powerful suction dredge. It is said that when the extensions to the harbour are completed, Karachi will provide accommodation for the largest vessels passing through the Suez canal.

Karachi is situated in latitude $24^{\circ} 53'$ North, and longitude $60^{\circ} 57'$ East, and has been of importance to India for over one hundred and fifty years, serving Sind, Northwestern India, Baluchistan and Afghanistan. At one time the trade of the port was valued at hardly more than £80,000 annually; in forty-five years this had grown to nearly £7,000,000; and just before the war the figures had risen to over £40,000,000.

In the year 1917-18, the imports were valued at little over £15,000,000, and the exports to something over £24,000,000.

Karachi is served by the Northwestern railway, which is a Government-owned and operated line. This system connects it with the rich grain and cotton-growing provinces in Northwestern India, and also with Calcutta and the cities in the interior. Karachi is some two days by steamer from Bombay.

Madras

Madras is situated in latitude $13^{\circ} 05'$ North, and longitude $80^{\circ} 17'$ East. It is about 1,000 miles southwest of Calcutta on the Bay of Bengal. The harbour of Madras is entirely artificial, formed by the erection of concrete piers built out like horns, which enclose a space of some two hundred acres. It allows vessels drawing up to 30 feet to enter, and can accommodate as many as fifteen at a time. The quays provide six berths, and there are additional mooring berths inside the harbour. The facilities of the harbour comprise an adequate number of cranes. A scheme for the extension of the harbour is under consideration. The port is served by the Madras and Southern Mahratta and the South Indian Railway, which gives it railway connection with all parts of India. The latter railway, it may be mentioned, is a metre gauge system.

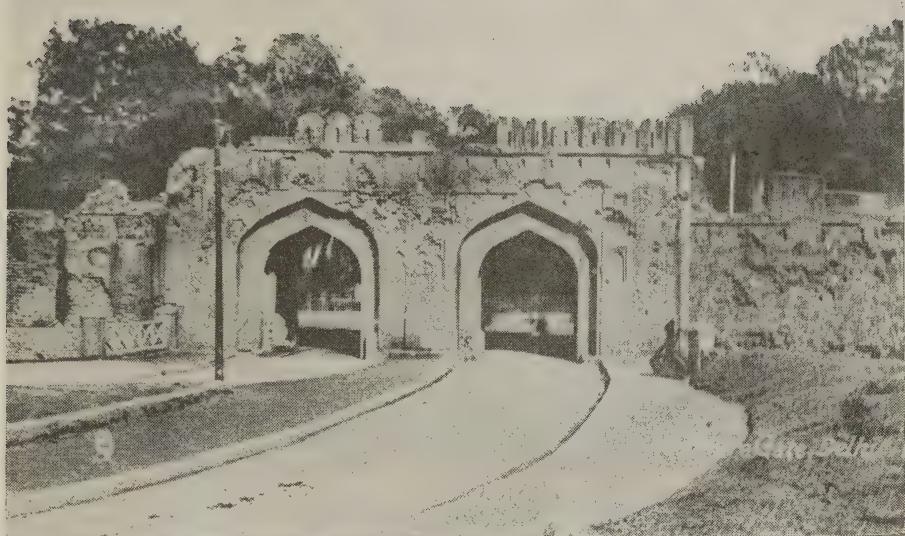
The total foreign trade of Madras in the year 1918-19 was valued at some £18,000,000, made up of £10,000,000 of imports and about £8,500,000 of exports.

Principal Trading Centres

In the interior there are a number of trading and manufacturing centres, some of which have attained considerable importance. One of the largest of these is Cawnpore, located in the United Provinces, which is an important distributing point for the surrounding country, and is very conveniently placed in relation to the two important ports, Calcutta and Bombay. The leather industry is carried on extensively in this city, and there are also flour and woollen mills and chemical works.

Delhi, the winter capital of India, is also a trading centre. It is particularly well situated for the distribution of goods, and it is also a very important railway centre from which radiate no less than six lines.

Agra, another important point, is well known to many Canadian firms as a collecting centre for hides, and on that account has given its name to a certain grade of this commodity.



Kashmir Gate, Delhi—untouched since the days of the Mutiny



Delhi, Chaudrie Chowk, (Principal Street)

Lahore, the capital of the Punjab, has a population of about one and a quarter millions, and is a railway centre of no little importance. Lahore is well laid out, and makes a very favourable impression upon the visitor. Amritsar, a few miles distant, is another well known distributing centre.

RIVERS, ROADS AND TELEGRAPHHS

India possesses three large navigable or partially navigable rivers—the Ganges, Brahmaputra, and the Indus, although the last is very much smaller than the other two. The Ganges is navigable for river craft to Hardwar, for small draft steamers to within a hundred miles of the mountains, and for loaded barges to Cawnpore, 140 miles northwest of Allahabad. On the Brahmaputra, a line of steamers plies up as far as Debrugah, about fifty miles below the angle made by this river on entering Assam. The Hoogly, which presumably can be classed as part of the Ganges Delta, is navigable throughout the year for a considerable distance. The usefulness of the Ganges and the Indus in transportation has been reduced by the expansion of railways. The Brahmaputra, however, is still of very great service, as it runs through a part of the country not so rich in railway facilities as the more central parts, and permits of steamers of considerable size plying its surface. In addition to this, there are several other rivers of sufficient depth to accommodate vessels for some distance from the sea.

In Burma there is the great river Irrawaddy, which winds its way throughout nearly the whole length of the country, and is navigable for boats and small steamers for 140 miles above Bhamo or 1,168 miles from the sea. The Irrawaddy indeed is the great natural waterway of Burma. It is owing to it that so much of the rich country in the interior has been opened up.

Roads.—The principal roads in India are of good quality and with fairly broad, well-metalled surfaces. While the total mileage of good roads is large, it is by no means adequate for the needs of the country. Before the British administration of the country, there were few, if any, good highways, so that the establishment of these and railways have brought about a revolution in the system of transport. The principal highway in the country is the Grand Trunk Road, which extends from Calcutta to Delhi. This is the famous road along which the troops marched to relieve the beleaguered cities of Delhi, Cawnpore and Lucknow, in the days of the mutiny.

Posts and Telegraphs.—The present postal system in India which has been established for nearly a hundred years, is very efficient. In 1899, India joined the International Parcel Post Union.

One interesting feature in this connection is what is called the Value Payable Postal System, which is practically similar to our express C.O.D. system. By this means parcels can be sent from any part of India and from the United Kingdom to India, and no doubt it is of considerable assistance to British retailers who carry on business with the peninsula.

The telegraph system in India is under Post Office jurisdiction.

CHAPTER VII

Indian Economics and Labour

India has a number of economic problems to solve, some of which become acute in times of depression such as the present, but fade comparatively into the background when prosperity reigns. One of the chief of these, to judge by the amount of discussion which it has evoked, is that of exchange. A tremendous amount has been written about this subject in books, magazines and newspapers, and a great deal has been said, but one wonders after all if it is such a problem as is represented, and if it does not, when all is said and done, resolve itself into a mere matter of remittances, which have to be made or received to settle the balance of trade, whichever way it may be. It should be noted that "remittances" include funds sent abroad for the payment of insurance, shipping, interest on duty, dividends on investments, etc. Indian exchange is of such immense importance that presently an attempt will be made to briefly explain it to Canadian readers. Other vital problems are connected with politics, religion, customs tariff, labour, transportation, and the establishment of industries. Politics and religion are mentioned because, although they are more or less separated from economics, they nevertheless exert a very powerful influence upon the country.

In considering Indian economics, one never quite gets away from the subject of the Monsoon, which as explained elsewhere, is the trade wind which blows from the southwest between April and October; sometimes it is late in beginning and sometimes early. Nothing else has such an enormous influence upon Indian economic life as this all-powerful factor, and between the extremes of total drought and abundance of rain, range all the gradations of prosperity or misery. Mr. H. B. Lee Smith in his book on Indian Economics, says "The fear of drought is the curse which Nature has laid upon the land," and a very short residence in India will convince almost any one that this remark is eminently true.

THE BUDGET

India is confronted today with a considerable budget deficit. The expenditure for 1919-20 amounted to £144,218,700, and the revenue was £129,850,600, leaving a deficit of about £14,368,100. To meet this the customs duties were increased. As Indian railway receipts are associated with the Government revenue, they have been increased by raising the rates. Rates in India are in some cases extremely low. One manufacturer acknowledged to the writer that, while it suited him exceedingly well, he felt quite sure that it was impossible for the railways to make a profit in transporting his products. As a result the revenue for 1920-21 was £134,252,600, the expenditure £132,248,000, and the surplus £2,004,600.

A further means of increasing the revenue of the Government, or it might be perhaps better said, to reduce the deficit of the Postal Department, would be to raise the postage rates.

EXCHANGE

A reference above has been made to the question of exchange, which as such, has agitated Indian commercial circles for the last year. In February of 1920 the rupee rose to as high as 2s. 10d. whereas according to the latest English quotation in January, 1922, it is just under 1s. 5d. Such a fall as this naturally carries in its train the most serious consequences, and its effect has been disastrous. While it is hoped that all the established houses will eventually weather the present crisis, most of them, to judge from reports, will be severely shaken.

Indian trade is to a large extent dependent upon the financial administration of the Government of the country, and the commercial world has been looking to the Government to assist it, but no government can control exchange. A government may at times interfere with the course of exchange, but as a rule it will finally find its own level. As already stated, exchange is a matter of remittance, and as long as larger amounts are being remitted from the country than are being received by it, just so long will exchange be unfavourable, unless it is possible to maintain a balance by shipments of gold.

Since this is such an important subject, it may be of some interest to trace briefly the recent history of Indian exchange, and this will necessarily include an outline of Indian Government finance.

INDIAN DEBT

On the 30th September, 1919, the national debt of India amounted to 568 crores of rupees, or something less than Rs. 24 per head of the population, which is very reasonable compared with other nations of the world. That Indian national finances are in such an excellent state is due to the care with which they have been administered by the Government. One heard complaints in India that the policy of the Finance Department is too conservative, and that the attitude adopted towards railways, irrigation projects, and agricultural development is too narrow. Possibly there is reason for this, when it is considered how immensely the country is benefited by the expenditures which have been made under these three heads, and particularly when it is remembered that two of them are actually and directly reproductive. However, it is to be borne in mind that the Government of India have no doubt looked upon their administration of the Indian revenue in the light of a sacred trust. Perhaps the advisers of H.E. the Viceroy, now that the people of India have a much greater voice in the councils of the Empire, will pursue a bolder policy.

Prior to the commencement of the war and the consequent necessity for military expenditure, the public finances of India were in a position that must have been almost unique throughout the world. To show this, it is worth while publishing the following figures which are taken from the *Indian Year Book* of 1920:—

	Registered debt in India	Registered debt in London	Interest payable	
	Rs.	£	Rs.	£
1820-21..	27,24,77,630	5,762,688	1,63,15,400	253,247
1850-51..	45,42,87,550	3,920,592	2,12,39,750	136,482
1870-71..	66,80,96,570	37,627,617	3,01,56,310	1,726,268
1880-81..	85,95,97,460	71,429,133	3,55,92,700	2,846,478
1890-91..	1,02,74,65,550	104,408,208	4,17,51,110	3,524,376
1900-01..	1,15,33,19,058	133,435,377	4,00,58,600	4,158,351
1905-06..	1,26,08,10,618	146,457,439	4,38,10,365	4,715,233
1910-11..	1,38,09,72,155	177,998,335	4,81,24,302	5,668,417
1913-14..	1,45,68,55,790	177,064,757	5,07,80,519	5,693,919
1916-17..	1,67,77,70,328	174,144,724	6,01,27,929	5,647,491

	Ordinary Debt	Productive Debt	Total Debt	
		Railways	Irrigation	Total
1893..	97.5	136.5	28.9	165.4
1898..	105.0	159.0	82.5	191.5
1903..	88.7	192.1	37.2	229.3
1908..	56.1	266.6	44.8	311.4
1913..	37.5	317.7	56.4	374.1
1914..	19.2	333.0	59.1	392.1
1915..	3.3	349.8	61.6	411.4
1916..	3.0	351.6	63.6	415.2
1917..	10.5	353.6	64.9	418.5
1918..	132.5	358.8	65.9	424.7
1919..	129.9	365.5	66.7	432.2

(The figures in the second table are in crores of rupees).

From the above it will be seen that on the 31st day of March, 1914, out of the total debt of 411 crores only 19 represented ordinary or unproductive debt. At that date par value of the rupees was 1s. 4d., so that 19 crores would only represent about thirteen million pounds. On the other side, the expenditure on irrigation and railways, a total of 392 crores, was productive to the extent of nearly 23 crores, which after paying for the service of the debt, left a net revenue of 9 crores. In view of the large expenditure incurred by the Canadian people on railways, canals, and other projects, this short account of Indian debt should be of considerable interest. It is more than likely that if India had not entered the war, her non-productive debt would have been wiped out prior to this.

Currency

Indian currency has been a matter of considerable concern to the Government for many years. In 1853, gold, which up to that time had been legal tender to the Government, ceased to be so; and this was further extended to transactions between private persons two years later. For forty years the standard of currency was entirely silver, but in 1893 exchange, which had been uncertain for some years, fell to 1s. 3d. The reason given for this by one authority is that the imports of silver into India had increased enormously, and this synchronized with the increased purchasing power of gold. To stabilize the value of the rupee, the Government of India in 1893 closed their mints to the free coinage of silver and declared a convertible value of rupees 15 to the sovereign. Since then India can be considered to have had a gold standard, although the rupee has been maintained as the chief medium of exchange. Later, in 1899, sovereigns and half-sovereigns were made legal tender in India at the rate of 1s. 4d. per rupee, so that if there was any doubt before, this absolutely fixed the rate of exchange between the two units. Since the measures above mentioned were taken, the value of the rupee remained steady until the influences of the war commenced to operate on it. A single exception perhaps was during the well-remembered commercial crisis which commenced in the United States in 1907, and which was felt throughout the world, when the Indian rupee became somewhat shaky, and would probably have fallen below its par value of 1s. 4d. if the Government had not taken strong measures to maintain its value. This was accomplished by the policy of selling Reverse Councils to amounts sufficient to ensure the maintenance of parity.

The opening days of the war tested the soundness of the currency system of India. According to all accounts it stood the crisis well, although it was necessary for the Government to undertake certain but not extensive operations to keep the rupee steady. It may be stated here that Indian paper currency issues, while they are not limited in amount, are covered by either gold, silver, British Government securities, or a combination of all three.

Mention has been made of Councils, and as Councils and their vis-a-vis Reverse Councils perform such an important part in Indian finance, it may not be out of place to explain them. To put it in a nutshell, Councils are the sale of exchange in India by the Secretary of State for India in London; and Reverse Councils are simply the reverse operations, conducted by the Government of India. If the Secretary of State for India requires funds to meet Indian obligations in the United Kingdom, he can obtain them by selling drafts on India, which will be met by the Government on presentation. The usual policy is to advertise that tenders will be received for Councils up to a certain amount, and if these are over-tendered for they are sold on a pro rata basis. This enables bankers, importers, etc., in the United Kingdom to settle their indebtedness in India by the simple operation of purchasing the amounts they require of these Council bills; and conversely the same class of people in India can settle their debts in the United Kingdom. The sales of Councils and Reverse Councils provide a very simple and excellent means of making remittances between the two countries. As will be gathered from the above, Reverse Councils have not

only been used in the ordinary course of trade, but also for the purpose of steadyng exchange; in the last few years they have been resorted to to a greater extent for this purpose than at any other time in the course of their history.

Indian exchange, which remained steady for so many years, began to show symptoms of breaking away about the middle of the war period, probably because of the rise in silver. As silver commenced to rise in price, the value of silver coins concurrently approached that at which it would pay to melt them down. In a country like India, where hoarding is so prevalent amongst the mass of the people, the only way to prevent the rupee being melted down was to give it a higher value; and about the middle of 1917, to meet the contingency which had arisen, it was necessary to raise the rates for Council Bills to 1s. 5d. Later on the value at various times was again raised to follow rising prices of silver bullion.

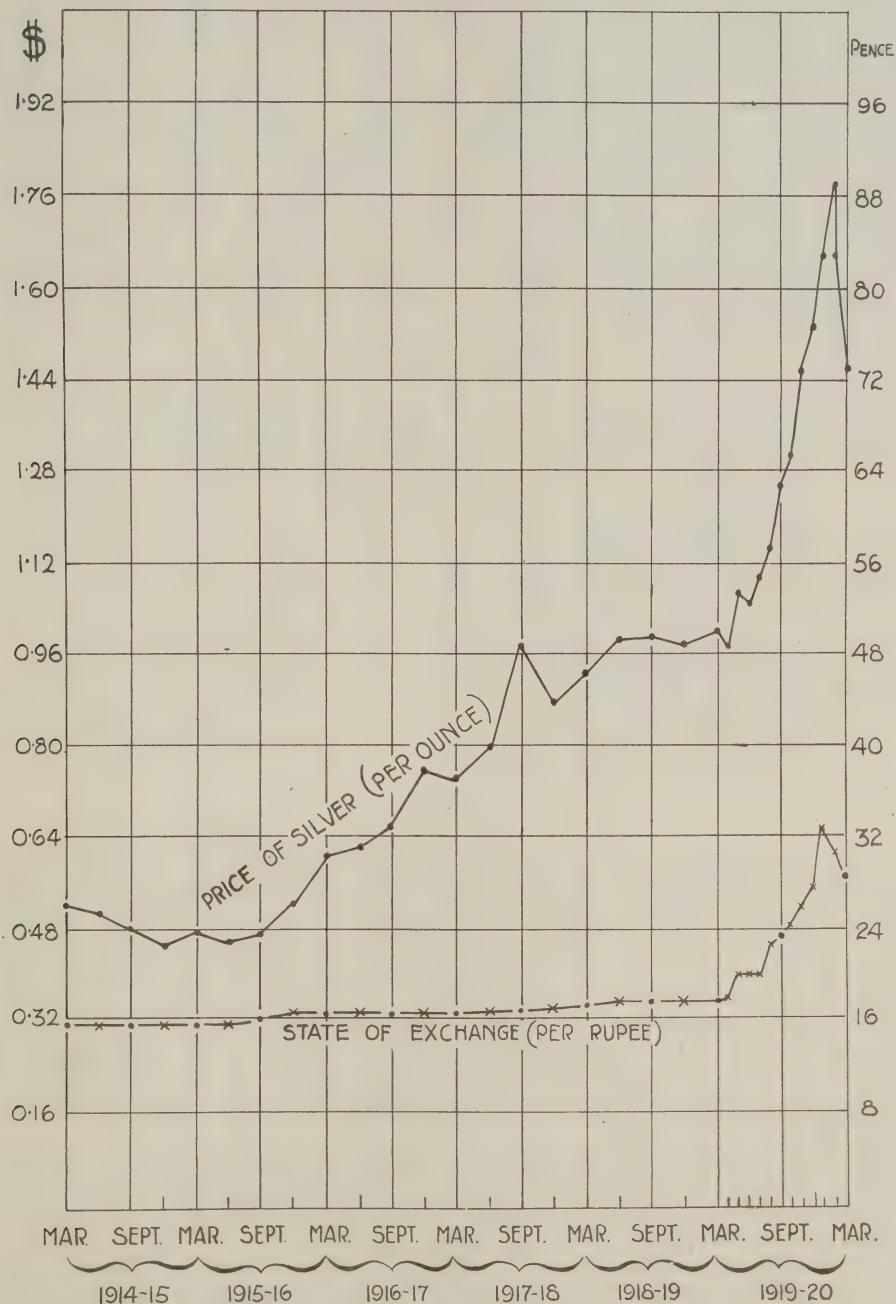
With a view to seeking a means of stabilizing the rupee, a Currency Commission was appointed in 1919 "to examine the effect of the war on the Indian exchange and currency system and practice, and upon the position of the Indian note issue, and to consider whether, in the light of this experience and of possible future variations in the price of silver, modifications of system or practice may be required; to make recommendations as to such modifications, and generally as to the policy that should be pursued with a view to meeting the requirements of trade, to maintaining a satisfactory monetary circulation, and to ensuring a stable gold exchange standard." This Committee reported in February, 1920, and *inter alia* recommended the following, that, "the stable relation to be established between the rupee and gold should be at the rate of rupees ten to one sovereign, or in other words, at the rate of one rupee for 11.30016 grains of fine gold, both for foreign exchange and for internal circulation." Later on in the year the recommendations of the Committee were approved and given effect to by legislation, so that the value of the rupee to-day is one-tenth the gold value of a sovereign.

When, after reaching its peak in February, 1920, exchange began to fall, the Indian Government made a very strong effort to support its value by selling large amounts of Reverse Councils. To maintain the price of the rupee, these bills were sold above the market value of exchange, which of course involved a loss to the Government. This operation was analagous to the hypothetical case of the Canadian Government selling exchange on London at the rate of \$4.50 to the pound when the banks were selling it at, say, \$4.70. The Indian Government parted with a considerable amount of its balance in London in endeavouring to stay the downward course of the rupee. But although their operations may have had the effect of retarding the rate of descent, it had little effect on the ultimate result, which to-day is reflected in the 1s. 4d. rate. As a matter of fact, it was stated in India that the only effect it seemed to have was that it put money in the pockets of a considerable number of people, who bought Reverse Councils, sold them to the banks, or else remitted to London to have the remittance immediately transferred back by T.T. (Telegraphic Transfer), thus making quite a handsome profit on the operation.

One of the most unfortunate effects of the fall in exchange has been the action taken by certain Indian indent merchant associations, who have refused to take up their bills until the rupee reaches its par value. They allege as their reason for this, that the Government led them to believe that the value of the rupee would be two shillings. This repudiation of their obligations presents a very serious problem, and it is one which can hardly fail to react very strongly upon the credit and good name of the associations concerned. The reason given by the associations can be nothing but a fictitious one, as any importing merchant of even average intelligence must be well aware that exchange is influenced by certain laws, and it is not in the power of the Government to maintain it at a particular value under the circumstances which have affected Indian commerce for some time back.

As a result of the action of these Indian associations, enormous quantities of goods have been held up at the ports of entry, and in the hands of manufacturers

PRICE OF BAR SILVER PER STANDARD OUNCE IN LONDON &
EXCHANGE RATE FOR RUPEE DEMAND BILLS IN CALCUTTA ON LONDON



who naturally refuse to ship their goods when they can have no hope of payment. As the goods are already manufactured, their value is temporarily lost to the manufacturer and his credit impaired to that extent.

A number of petitions have been addressed to the Government of India to further assist in righting the exchange; but having interfered once without result, and at a considerable expense to the country, it is not likely that it will make another attempt, or at least not until imports and exports more nearly balance themselves. As a matter of fact, the fall in exchange is simply due to the fall of exports both in quantity and value. The huge amount of imports has made a very large adverse balance in the trade. Also, when the rupee in the early part of last year was so high, it led to enormous quantities of capital being remitted out of India to the United Kingdom. People even went to the extent of borrowing money in order to take advantage of the high rate. The effect of this will wear off, or what is more likely, the money will be returned in order to make a handsome profit on the reverse transaction, and the volume of imports should very shortly commence to slacken. But it is hardly likely that exchange will become normal until demand in Europe for Indian goods largely increases.

INDIAN BANKING

The financial operations connected with the foreign trade of India are conducted through the medium of exchange banks; of these there are some thirteen:—

Chartered Bank of India, Australia and China.
Hongkong and Shanghai Banking Corporation.
Eastern Bank, Limited.
Mercantile Bank of India, Limited.
National Bank of India, Limited.
National Bank of South Africa.
International Banking Corporation.
Comtoir Nationale d'Escompte de Paris.
Imperial Bank of Persia.
Russo-Asiatic Bank, Limited.
Yokohama Specie Bank, Limited.
Sumitomo Bank, Limited.
Taiwan Bank.

Exchange banks should have lately considerably enhanced the strength of their position, as there is little doubt that in recent years very handsome profits have been made in connection with exchange operations. However, this should not be begrudged them, as they have been of enormous assistance to the trade of India. The financing of exports from India calls for less capital than that of imports, as in the first case the banks may send bills to London where they can be sold in the discount market, making it necessary for them to be out of funds advanced only for such time as it takes the documents to travel from the Indian port to London. As India has no discount market, it is necessary for the banks to finance the shipment until such time as the bills are paid for by the Indian importer; unless, of course, the bills are taken over by the local banks.

The exchange banks have a monopoly on exchange business, as the Presidency banks of Bengal, Bombay and Madras, now merged in the Imperial Bank of India, are constitutionally debarred from engaging in such business and are compelled to confine their operations to India and Ceylon.

The banking institutions are not only able to secure funds for their operations from English depositors, but also from Indian. In early years, apparently the Indian was not inclined to lend his money to banks for their own purposes, but this attitude has changed of late, and according to the authorities they are now able to

secure almost all their needs from the people of the country. The figures given for deposits by the natives of India have risen to over 53 crores of rupees, which is an increase of over 500 per cent in from twenty to twenty-five years.

The Presidency banks have largely increased in wealth and influence in the last twenty or thirty years. As an instance of this, it may be stated that the Bank of Bengal had a reserve in 1895 of 68 lacs of rupees, which five years later had increased to 103 lacs, and at the present time it is nearly 200 lacs. From a dividend of 10 per cent, it now pays 17 per cent, or did two years ago. In 1918 the Bank of Bombay paid 18½ per cent dividend. Between 1895 and 1918 the Bank of Madras was able to increase its reserve from 16 to 50 lacs. These figures not only reflect the increase in the wealth of the country, but also very prudent management on the part of the institution.

In addition to the Exchange or Presidency banks, there is another class known as Joint Stock Banks. Beyond this again are the private bankers and shroffs. The shroff is a money lender, and in India he occupies very much the same position as the compradore in China; that is to say, he acts as an intermediary between the bank and the person requiring a loan. He is generally a man of means, and it goes without saying of the very best credit. He lends money out to the trader, and when exhausted borrows from the banks on his own security. This method of doing business has proved very satisfactory to the banks throughout the Middle East and in China, as it would be quite impossible for the banks to have a sufficient knowledge of customers to know whether they could trust them or not. The shroff with his wide knowledge is able to take the risk.

The bank rate is fixed by the various Presidency banks within their own spheres of action. This rate is that which is charged for loans against the very highest securities such as Government paper. Loans against other securities are usually slightly higher. The Presidency banks also act as clearing houses in four centres, namely, Calcutta, Bombay, Madras and Karachi.

In 1907, according to the *Indian Year Book*, the total amount of cheques cleared in the four centres mentioned above amounted to 37,176 lacs. In 1918 this had risen to 132,716 lacs, although it might be explained that this was a huge increase over any previous year.

LABOUR

Another subject which is intimately connected with Indian economics is labour.

Indian labour is an extremely difficult problem, although, as probably any manufacturer will concede, it is poorly paid. The industrialist claims, and no doubt with much justice, that to increase the remuneration of labour, does not put very much more money in the man's pocket, but simply leads him to doing less work. The Indian labourer must not be considered in the light of European or North American standards, as physically and temperamentally he is entirely different. His habits, his outlook on life, and his religion, are totally different. He is happy-go-lucky, and goes on the principle of giving no thought to the morrow, and if he has only wages on hand to keep him going for a couple of weeks, he is very inclined to give up work and take a holiday. That he actually does this is one of the worries that make miserable the lives of managers and foremen in Indian industries. In the report of the Indian Industrial Commission it is alleged that, "in the case of Bombay, witnesses have stated that since the 10 per cent rise in the wages of mill operatives given during the rains of 1917, there has been an actual falling off in output." Speaking generally, the Indian dislikes work, and it is only absolute necessity that drives him to it. One of the worries which employers have to contend with in India is that their employees do not work steadily. Many of them own plots of land and return to their villages to prepare their sowing, and later on to reap their crop,

unless they have made arrangements to have this done by some one else. It will be readily understood how such a practice in Canada would add to the difficulties of manufacturers.

As the Indian labourer is uneducated and lives under the most wretched conditions, and is moreover a fatalist, he has not the same stimulus as the Canadian labourer or workman to improve his condition by making more money. This is emphatically shown by the actions of piece workers, whose desire seems to be to make enough money to allow them to idle for a few days at a time. Possibly in time, as the conditions of life in India gradually improve, and education percolates down through the vast mass of society, labour may change its attitude and become more responsive to the stimulus of higher wages and the possibility of becoming independent. It may be also that the labourer will eventually be weaned from his love of the land, and will resign himself to becoming an industrial labourer pure and simple. No doubt this will be beneficial to industry, although its effect on the Indian himself can hardly be so called, because of the unhealthy mode of living in the poorer quarters of the large towns.

But in spite of the characteristics of the Indian mentioned above, it is quite extraordinary the good work that can be and is being done by him. In classes of work which have been handed down from father to son the Indian is very skilful. If, however, he were to be taken off that particular kind of work and put on something else, his value would probably be reduced by 50 per cent. He is at his best when engaged on one class of work, and one only, as he uses his brains very little and is most machine-like in the performance of simple operations.

TECHNICAL SCHOOLS

Technical schools are maintained in India, but in their results do not seem to be very successful. It is said that they are largely attended by the sons of better-class Indians who have a contempt for manual labour, so that on leaving the school they do not put into practice the valuable training which they have received. On the other hand, the artisan class which would benefit by this training has an intense dislike for work of a mental nature, so that between the two extremes technical schools are not of the same assistance to industry in India as they are in other parts of the world. Probably if the system attempted an education of a very simple nature such as reading, writing, arithmetic, and enough English to understand orders and directions, together with some time spent on manual training, it might be more successful.

It was stated by witnesses before the Indian Industrial Commission "that the spread of education among the artisan class tended to bring manual labour into contempt, and that the sons of artisans educated beyond the primary stage showed a distinct tendency to forsake their father's calling in favour of clerical work, but we think this view must be due to the wrong system of education which has been made available."

A reference was made elsewhere to the policy of education for boys pursued by the two cotton mills in Madras. This has proved abundantly successful, as it is not only beneficial to the labourers themselves, but has also been so to the mills. Indeed the company does not pretend that the object of the school is philanthropic; it is run as a purely business adjunct to the mill. The aim of the management has been through their schools to attract the best class of labour, and by educating the children, to evolve an intelligent workman and to attach him to the mills. The school, which started on a very small scale, has shown constant expansion.

A member of the firm above referred to stated to the writer on a tour of the schools, that the first noticeable effect of the education given to the children was to produce in them a desire for a clerical vocation, which bears out the statement just quoted. To counteract this they introduced manual training, by which the young

student is made familiar with all the operations in connection with spinning and weaving. In this way they have interested him and to a great extent have modified his ambition to engage in a clerical vocation.

In addition to the workshops for teaching spinning and weaving, there are others in which the boys are instructed in carpentering, blacksmithing, and tailoring. There is also a night school. Included are an excellent playground and gymnasium, and a kitchen, where the boys can obtain food at a nominal price. No food is given free, as it is better for the boys to pay for what they require than that they should receive it in the form of charity. It is said that the boys who have been through the school are found to be more frank, more intelligent and smarter, cleaner and better behaved in every way than the boys who have not had a similar opportunity. The boys while going to school also work as half-timers, it being permissible for children between the ages of nine and fourteen to be employed in industries, but not for more than six hours a day.

It is a thousand pities that more industrial establishments in India are not imbued with the same fine spirit as is shown by the directorate of these mills in Madras. If it were so, there is little question but that the class of work would rapidly improve with the rising intelligence of the artisans, who would themselves become less of a prey to the influence of agitators, political or otherwise.

So far as one can judge by inquiry, the average industrial labourer in Bengal receives about half a rupee a day, or perhaps ten annas. In Bombay the wages are higher. At the present rate of exchange this equals a wage of fifteen to twenty cents a day. In the Bombay cotton mills the wages paid to drawers are Rs. 62 per month, reelers Rs. 24, warpers Rs. 100, ravers Rs. 39, doffers Rs. 19, and weavers Rs. 71. These wages represent a considerable increase as compared with those paid in pre-war days. The above figures have been kindly contributed by the head of a firm of managing agents who control several large mills in Bombay. In Calcutta the writer was informed that *maistries*, or mechanics, were paid from about 30 to 60 rupees a month. Although Indian labour is paid so little compared with the wages in this country, yet many industrialists claim that it is virtually more expensive than European or North American labour owing to the inefficiency and lack of intelligence of the Indian. Furthermore, on account of this inefficiency Indian labour requires an immense amount of supervision, and this must be by Europeans brought out from the United Kingdom at considerable expense. Naturally to remain in a country like India, they demand high pay, and the firms are never sure whether they will be satisfactory or not until they have been tried out.

CHAPTER VIII

The Market for Provisions

As may be seen by the trade returns, India is a large importer of provisions. For the year ending 31st March, 1920, the total imports of provisions amounted to Rs. 2,90,93,096, which shows a considerable increase over those of the two preceding years. The imports for the months of April and May of 1920 amounted to Rs. 72 lacs. The imports of food products into Ceylon for the year 1919 were fairly large in proportion to the native population. Of the imports into India the largest portion came from the United Kingdom, after which follow the United States with over Rs. 62 lacs, the Straits Settlements with over Rs. 52 lacs, and Australia with nearly Rs. 27 lacs. Canada is not shown separately in the returns, her business being too unimportant, but she is included with "Other Countries," whose trade only amounted altogether for the last year to Rs. 13,03,934.

The most important item of provisions is canned and bottled fruits, and next to that farinaceous and patent foods. Condensed milk is also a large entry amounting to over Rs. 40 lacs, biscuits and cakes to over Rs. 29 lacs, bacon and hams over Rs. 17 lacs, cheese over Rs. 8 lacs, and tinned and canned fish over Rs. 10 lacs.

BACON AND HAMS

Taking these articles up in the order shown in the statistics, we come first to bacon and hams. The chief sources of supply for these commodities are the United Kingdom and Australia. The market in India for the flesh of the pig is restricted more or less to Europeans and Eurasians, or as they are most usually now called, Anglo-Indians. Hindus and Mohammedans are precluded by the rules of their religions from eating such meat—in fact, it may be stated here that the adherents of these two faiths are very small consumers of imported provisions.

The imports of bacon and ham into Ceylon are not large; in the case of the former they only amount to 564 cwt., and in the latter to 563 cwt., the bulk being supplied by Australia.

The statistics of India do not show just what proportion of bacon and hams come from Australia, but judging from the remarks of dealers it would appear that in recent years the trade with that country has considerably increased, although it also seemed evident that they would very much prefer to obtain all of their supplies from the United Kingdom. A certain amount of bacon comes in from the United States, and at least one fairly large consignment was imported from Canada during the war, but the exports of neither country seem to have given satisfaction to importers in India. Indeed, one of them, who claimed to have a long experience in that country, went so far as to say that in his opinion United States packers do not know how to cure bacon for export. He said that he had been familiar with American bacon for seventeen years, and during that time packers had not improved their methods. Importers complain that the requirements of India are not sufficiently studied, whereas owing to its climate and other conditions, they should be specially considered and catered for.

Bacon should not be too fat, but streaky, for the Indian market; in such a hot and moist climate extending over a large part of the year, it can be well understood that too fat bacon or hams are not desirable. The demand is almost entirely for bellies and fairly thin middle cuts; gammons and forequarters are not desired. Importers advise that bacon and ham should not arrive on the market after the month of February, except in very small quantities. And they further state that small and frequent shipments are much preferable to large and more infrequent ones, as with the former the market is always just a little under-stocked, which creates a much healthier condition, than when it is on the full side.

Bacon and hams should be shipped in pieces of 10 to 12 pounds and packed about 10 or 12 pieces to the case. They should be wrapped in canvas and packed in sawdust, or in a mixture of husks and salt. And it must be specially noted that the salt, which under the customs regulations is a dutiable article, should be well mixed up with the husks, as otherwise it will be subject to customs duty.

It is reported that the provision market in India is tricky and hard to judge, and is very much affected by the probability of a good or a bad monsoon, but the same may be said of all other commodities.

It was suggested that Canadian exporters wishing to enter this market might test it by sending out small shipments on consignment consisting of, say, five cases of bacon and hams. This is sound advice, as there is little chance of loss being thus incurred, and it would be a simple method of demonstrating the class of goods produced, and an earnest of a keen desire to compete in the Indian market. This course should not be pursued indiscriminately, but the experiment might be tried

with, say, four to six of the leading European importers. The opinion was expressed that it might be to the interest of Canadian exporters, or probably better still, a group of exporters, to establish their own office in the country, as they would thus be assured of first-hand information, and would be in a better position to cater for the needs of consumers. This remark does not apply to bacon and hams only, but is meant to cover the whole range of those provisions in which Canadian exporters are interested. The markets of Ceylon, the Netherlands East Indies, Malaya, Siam, and the Persian Gulf could all be worked from India.

With regard to the consumption of imported provisions by the people of India, dealers seem to be of the opinion that the higher classes are showing a tendency to buy certain kinds of European food, and that in the future this promises a growing market. The Burmese being Buddhists have no scruples in regard to eating imported food, the only restriction being the inability of the vast majority to pay for it. The same remark applies very largely to the people of Ceylon. Both the Burmese and the Sinhalese are inclined to spend freely; and in Burma there are in addition to the natives and the Europeans, quite a large body of Chinese, who are known to be, outside of their own country, very free spenders.

BISCUITS

India and Ceylon consume considerable quantities of biscuits. Dealers who have been asked as to the likelihood of Canada being able to secure a share of this trade, were not encouraging. They stated that the trade was practically in the hands of one particular firm of British manufacturers, and seemed to be very doubtful of Canadian manufacturers being able to compete with more success than that which had been obtained by other firms not only in the United Kingdom, but in other parts of the world. This is not to say that only one make of biscuits is sold; there are others, notably one of cream crackers made in the United Kingdom, and another of ordinary biscuits made in Australia, the latter of which are imported done up in 6-pound tins. The usual size of tin from the United Kingdom is 2 pounds. Biscuits form one of the few lines of provisions that are fairly widely consumed by the people of India, so far as their means allow.

The reason given for the wonderful popularity of the British firm mentioned above is that its goods are uniformly of excellent quality, and keep exceedingly well, so that when opened, they are found to be as crisp and fresh as when originally packed. In a market like India such characteristics are of the highest importance, and when dealing with people who are inclined to be suspicious, and absolutely cannot afford to waste even one tin of biscuits, they have an immense weight. Judging by results, this firm are reaping the reward of merit, for they have built up a splendid reputation by enterprise, by forceful and aggressive methods, and by putting quality and their good name before every other consideration. Owing to the exigencies of the war they lost practically the whole of their Indian trade, and the market was wide open for the competition from other countries which developed. But immediately the war was over, and this British firm were able once more to resume their shipments to the Indian market, the consuming public quickly dropped the substitutes and went back to their favourite brand. The experience of this firm contains a moral which it would be very profitable for all exporters to carefully consider—namely that in the end, quality and integrity always pay handsomely, and this has never been more true than in the present era, when the get-rich-quick craze has undermined to some degree the good old solid business principles.

The trade in biscuits is said to be cut extremely fine. The kinds most in demand are those such as Petit Beurre, Marie, etc., and there is also an extremely large demand for cream crackers, which are practically the same as what are known as soda crackers in Canada.

In spite of the fact that one or two marks, and particularly one, enjoy an immense popularity, and it is difficult for a new one to establish itself, nevertheless in view of the fact that Canadian biscuit-makers are able to produce a biscuit of very high excellence, they should not be deterred from an attempt to sell their products on the Indian market, especially a cream cracker. The sale of biscuits is one that, it can safely be predicted, will enormously increase in the future, as even an addition of annas four a day to the average income of the inhabitant of India would probably react powerfully on this particular line of trade.

CHEESE

Cheese is imported principally from England, Holland, and Australia, although there is a certain amount of tinned cheese coming in from the United States. The demand for a large cheese is small, although it is purchased to some extent by the retail stores, and usually comes from the United Kingdom. It comes out wrapped in canvas and packed in sawdust, in cases, for it is very essential that cheese should be well protected. A certain amount of Canadian cheese in glass jars is sold in India, but owing to its price the demand is necessarily extremely limited. Apparently of all cheese, Dutch is preferred.

As a rule, cheese is imported either in nominal 1-pound tins or in loaves of 10 to 12 pounds. The former, while they are supposed to be 1 pound, are probably more nearly 13 ounces. It is very essential that tins of cheese be hermetically sealed. Dealers are loath to handle cheese and only do so because of a constant demand from the public; they claim that it is an unprofitable business, being too liable to loss.

Canadian exporters desiring to enter this market should quote for the 56-pound cheese—even if as has been stated the business in it is trifling—for 10 and 12-pound loaves, and for 1-pound tins. If they would be willing to send out a small shipment on consignment as a sample there would be small chance of loss if of good quality and well packed, and it might be a means of opening up business relations. The 10-pound cheese loaves are usually packed six to eight to a case. There seems little doubt that a good deal of the cheese which is sold in this market as English cheddar was originally produced in the Dominion, and Canada might just as well enjoy the benefit which comes from the production of a good article, as allow it to go to outside exporters.

There is said to be a good deal of loss in cheese, through shrinkage, and it is in favour of the Australian article that the loss through this cause is stated to be reduced to a minimum. One dealer made the statement that he had known large cheeses to lose as much as 10 or 15 pounds on a voyage. Cheese is sold at invoice weight by importers, but at the same time, purchasers as a rule carefully check it up. One dealer suggested that shippers of cheese should test their product up to a temperature of 100° moist heat, afterwards reduced to 75° , in order to ascertain its qualities for withstanding the changes of the Indian climate.

CEREALS

The imports of cereals amounted last year to over Rs. 63 lacs, or roughly over £630,000, which shows an item of considerable importance, and a business well worth cultivating. The imports of cereals have steadily increased during the last three years. So far as can be gathered, this entry is made up very largely of one well-known brand of oats, which is imported from the United States. As this particular mark is also made in Canada, it seems rather a pity that India, being a part of the British Empire, is not supplied from the Dominion.

The market in cereals is said to be most treacherous, one reason being that this product is much affected by the weather, and another, that while at one time the market may be rather overstocked, at other times it may be very bare, and while in

the former case the goods may be sold at a loss, in the other they can be sold at an excellent profit. Some dealers refuse to touch cereals under any consideration.

In addition to the demand for oats, there is also a market for such other cereals as pearl barley, semolina, etc., most of which is imported from the United Kingdom. One or two dealers found fault with the packing of the American oats, and gave it as their opinion that the English packing of cereals is the best in the world. However, dealers on this subject, as on many others, differ widely, and so far as could be judged the American product, taking it all in all, is highly satisfactory. To show the difficulties of the market in cereals, one importer stated that he knew of instances when the oats referred to cost Rs. 6 landed into store, and were actually sold in the bazaar for Rs. 4.

It must be frankly acknowledged that any competitor to the brand mentioned would have serious difficulty in establishing himself in the market. Probably the only way would be for an exporter to send out small shipments on consignment to reliable dealers, or else be prepared to sell his product at a slightly cheaper price than that of his competitor. It seems unlikely that in any other way could a new brand establish itself on this market. This is one of those lines in which the exporter must make up his mind as to his line of policy, and having embarked on it stick to it. But before taking any resolution which might call for considerable outlay, it would be very advisable to thoroughly canvass the market, in order to inquire whether prospective gains would compensate for the immediate difficulties.

JAMS AND JELLIES

The market for jams and jellies, as seen by the figures, is not large, the total only amounting to slightly over Rs. 3 lacs. Canadian jam is probably too expensive for this country, as the greater portion of the supply comes from Australia, which can export to India at a very much cheaper price than Canadian makers, although the jam may be of a much inferior quality. As the market for high-class jam is limited, it has been suggested that it would be better to put up a good article in a glass jar rather than in a tin, on the principle that those people who will buy the best quality are not very particular about price, and are more likely to be tempted by an attractive-looking bottle or jar than by a tin. The demand is for the usual kinds, such as strawberries, raspberries, greengages, apricots, red currants and black currants, marmalade, etc. It is well to mention that apple jam is not popular. Jam usually comes out in cases of 72 tins or jars packed in sawdust. The Australian article has become much more popular in recent years, and Australian exporters are adopting the excellent practice of sending representatives over to India to carefully study the market, and importers say that since this policy has been followed the quality of the Australian jam and its packing have immensely improved.

MILK CONDENSED AND PRESERVED

Condensed and preserved milk is an important item, imports amounting in 1920 to over Rs. 40 lacs, or at the par rate of exchange, some £400,000. The Indian market for condensed milk is practically in the hands of one large combine. The position in India is by no means unique in that regard, as the firm in question appear to control the tinned milk trade more or less throughout the world. Several competing brands have come into the market, but immediately they make headway, it is alleged that they are swallowed up by the larger organization, which for strong, aggressive, and highly efficient methods is probably unsurpassed in the world.

Dealers state that it will be practically useless for any competitor to attempt to establish himself on this market, unless he be fully prepared for a stiff fight, and further, before the importer would care to handle the new goods, he would require

to be assured of constant supplies, as otherwise he might fall between two stools. Apparently importers have a very wholesome respect for this big selling organization, and would be very loath to do anything to jeopardize their own position.

The best market in India is in Burma, where, as has been already stated, the people are good spenders, and have a strong predilection for condensed milk, for use with their tea, and also to eat with bread. Apart from Europeans, who take it when unable to get fresh milk, there is no sale for an unsweetened brand. The native, whether he be Indian or Burman, requires a milk either full cream or skimmed, and as cheap as possible. From what could be gathered from dealers, apparently the best demand is for a sweetened milk that can be watered down. In June of 1920, dealers in Rangoon stated that full cream milk was selling at Rs. 28 per case, less annas 12 or Re. 1 discount, ex godown, and skimmed milk was selling at Rs. 18 to Rs. 20 per case. These prices are large increases on those which were in force before the war, but this is only to be expected in view of the fact that competition has been practically reduced to nothing.

So far as the introduction of a new brand of condensed milk is concerned, as in the case of cereals, dealers must be assured of a constant supply, and at a price somewhat under that of competitors. In fact, the exporter of a new mark must be prepared to forego his profit for a certain length of time, perhaps to even go somewhat beyond that, and to spend something on advertising. But it is useless to consider such a question from the point of view of the immediate future, a long view must be taken, otherwise it would be folly to waste money in a sales campaign.

The imports of condensed milk into India for the year ended 31st March, 1920, amounted to about 7,586,809 lbs., which is an increase of about 3,000,000 lbs. over the previous year. The imports into Ceylon for the year 1919 amounted to 871,810 lbs. of full cream milk and 48,000 lbs. of skimmed milk, which shows that in proportion to population, the island spends on this article thirty or forty times as much per capita as does India. The whole market was supplied by the United States and Australia, the larger share going to the former, which country is credited with the whole supply of condensed skimmed milk. The statistics of India do not show the origin of supply of imported milk, but it is very likely that it is derived from the same source as Ceylon.

PICKLES, CONDIMENTS, ETC.

The market in India for this class of goods amounts to about Rs. 6 lacs, the larger share of which was exported from the United Kingdom and the United States. It appears that English pickles are much better liked than those from the United States, although the latter country is strong in sauces, particularly in such classes as tomato catsup, chili sauce, etc., and one large and well-known firm with branch establishments in Canada appears to enjoy a large measure of popularity.

CANNED AND TINNED PROVISIONS

The demand for tinned fruit is an exceedingly active one. The total amounted in 1920 to nearly Rs. 73 lacs, or in the neighbourhood of £730,000, and for Ceylon to 3,635 cwt. for the year 1919, valued at Rs. 187,000. It does not take one very long to realize that this trade is largely in the hands of California packers. Wherever one goes in the Middle East, one finds that three or four United States firms are the best known and between them largely control the trade. This is owing to the excellent quality of the fruit put up by these American shippers, combined with attractive labelling, excellence of packing, and aggressive and efficient methods, which fully entitle them to all the success that they have won.

When calling upon a certain importer, he informed me that he had obtained some samples of Canadian fruit and produced and opened them, and also a sample

or two of Californian fruit. On examining the different kinds of fruit, it had to be acknowledged that however good the taste might be—and in that the Canadian is not surpassed—the appearance compared but poorly with the Californian article. The latter was more firm, better coloured, and the Canadian pears showed a big gouge where the core had been extracted. The gentleman who showed me this fruit put it in this way: "In your opinion, which of these tins of pears would the house-keeper choose if she wished this fruit as an attractive dish for her table?" One had in honesty to acknowledge that she would certainly choose the Californian. This importer in criticising Canadian fruit stated that it was badly packed, and that it was small, ragged, and had been roughly handled, and further that some of the tins were blown. It certainly seemed that the firm who sent these goods had been at small pains to examine the quality of the products which they were handling. It must be distinctly understood that this particular importer is an Englishman, and there was no mistaking his very evident desire that Canadian goods should be able to compete with those of the United States, and his strong prejudice in favour of the former. He was perfectly sincere and frank in his criticisms, and there was no doubt that he made them with a view to pointing out defects, so that if Canadian exporters were really serious in their determination to compete in this market, they might have the necessary information to enable them to overcome the defects, which were only too evident.

One of the points in favour of the Californian packers is, according to importers, that they supply a quality of goods which they find unobtainable from any other source, are entirely familiar with the requirements of the Tropics, and that they pack their goods to suit tropical conditions. It must be distinctly understood that India is not a market in which any class of goods can be sold. It has its likes and dislikes, and a very keen appreciation of a good article, even though prices will more often than not weigh in the end. However, the question of price does not apply so strongly to tinned fruits as to most other commodities. One thing is very certain, that Canadian tinned and bottled fruits will never establish themselves in India, so long as they can be compared unfavourably with the Californian product, and this is particularly so when the prices are more or less equal. It is said that one of the California exporting firms has worked up its present reputation and position within the last five or six years, and simply by aggressive methods, good packing, and by selling only a really high-class article.

It was satisfactory to find that adverse criticism did not extend to all Canadian tinned fruit, but only to the larger grades. Canadian strawberries and raspberries which have been seen have drawn forth admiration, and the importer who adversely criticised the peaches and pears was equally outspoken in his praise of the smaller fruits, and he stated that he would be exceedingly pleased to obtain opening prices for them, in order that he might be in a position to place an order.

The fruits most in demand are the usual kinds such as pears, peaches, plums, cherries and the smaller ones such as strawberries, raspberries and red and black currants. Importers advise that owing to the climate of India, tins should not be quite full, particularly those containing stone fruit, as they said that if this latter was not quite ripe when tinned, it would be almost bound to swell, and consequently to blow the container.

In Ceylon the largest share of tinned fruits was supplied by the United States. The figures under this heading also apparently include jams, but they are not very clear. South Australia is credited with Rs. 32,000 and British India with Rs. 54,162, but it is quite possible that a good deal of the latter is made up of re-exported goods.

[NOTE.—After the paragraphs on tinned fruits had been written, a small shipment of Canadian tinned fruit arrived in India. The importers of this consignment were seen by the writer, and unfortunately expressed themselves as most dissatisfied with the quality of the goods. They stated that the pears which they had opened were small, gritty and unattractive to the eye, although in their opinion the packing

itself and labelling was all that could be desired. They opened a tin of plums in my presence and were no more satisfied with these than were the importers of the pears already referred to, and certainly so far as the quality of the fruit was concerned, they were perfectly justified in their complaints. They, like all other importers, compared this fruit to the Californian, of which they could not speak too highly.]

LABELLING

In connection with tinned fruits, jams, and tinned fish, labelling is of the very greatest importance. One of the criticisms levelled against Australian goods is that they are very poorly and unattractively labelled. Importers pointed out examples of this, and putting the Australian side by side with examples of American and British labels, compared the first with the two latter in a most unfavourable way. One of the most attractive labels for tinned fruit, was one with a black ground, on which the various kinds of fruit contained in the tins were depicted in colours exactly resembling those of the fruit itself. It could not be doubted that such an attractive label must influence the public in favour of that brand. Human nature being what it is, an attractive label can hardly fail to engender the thought that the fruit or other product within the tin will be good. It is the same influence which operates on a person who enters a clean and well-ordered provision shop, as compared with a dirty, untidy, and ill-smelling one.

One of the English exporters has a very attractive bright blue label, on which the name of the fruit is printed in bold black letters, and the tins are further wrapped in bright blue tissue paper. This necessitates a certain amount of trouble, but so does the packing of the fruit, and its tinning and labelling, and if a little more will add to its sale, there seems no adequate reason why it should not be taken. In fact, as the original idea in the mind of the packer is to sell his product, no operation which will assist this should be omitted, providing it is a commercial proposition.

The system of sending out labels to be reapplied where the original ones have been damaged is to be deprecated, as, if the importers be not absolutely reliable, they might use them to sell an inferior product, thus damaging the reputation of a first-class firm. Or they might fall into the hands of unauthorized persons, and be equally injurious. The best plan therefore to follow is to send out no extra labels whatever, except in most exceptional circumstances, and then only on the distinct understanding that they will be always kept under lock and key. As a matter of fact there should be no necessity for relabelling if the goods are carefully packed in the first place, as any subsequent damage would probably be negligible.

The tin containers for fruit should invariably be lacquered within and without. Some firms have tried painting tins on the outside to prevent rusting instead of lacquering, but this has been found to be unsatisfactory. Lacquering inside and outside may be a little more expensive, but it will always pay, and the added cost can be placed on the goods. One dealer advised that the name of the maker should be stamped on either the top or the bottom of the tins, as a preventive against the counterfeiting of labels. It should be added, however, that this point was not raised by other importers.

TINNED AND CANNED FISH

Canned salmon is the one class of provisions which in the Middle East seems to be largely imported from Canada. The word *seems* is used as the statistics do not show the countries of origin of the various kinds of provisions, but the opinion is based on information gained from importers, and from observing the labels of tins displayed in shops. But the imports from Canada are more noticeable in Java and Malaya than in India or Ceylon. There is no apparent reason for this unless it be that canned salmon is more easily shipped to Singapore, and from thence through

Malaya and to the Netherlands East Indies, than it is to Indian ports. For the year ended March 31, 1920, the imports into India amounted to 14,693 cwt. of tinned and canned fish, and into Ceylon the imports were 117,762 pounds for the year 1919, the larger part of which can safely be said to be composed of salmon and sardines, particularly the former.

The market for red salmon is small, and is confined practically entirely to Europeans; nor can it be said that there is in India a market for chum salmon outside of Burma. The greatest demand is therefore for pink salmon, or the medium grade. As Canadian salmon bears as good a reputation as the United States product, aggressive methods should obtain for Canada as large a share in the trade as her competitor across the line, or even possibly capture the greater share of it. In view of the fact that British dealers would prefer to handle a Canadian product to that of one outside of the Empire, Canadian exporters should feel encouraged to make every effort to control the imported salmon trade of both India and Ceylon. As has been stated, the consumption in India of chum salmon outside of Burma is very small, but in the latter province there is plenty of opportunity to do a considerable amount of business. The Burman is very fond of fish, and this predilection is fully shared by the Sinhalese. What they mostly demand is that it should be cheap; consequently chum salmon should appeal to both of these peoples.

Sardines are being imported from the Pacific coast as well as from Europe. Dealers were not in agreement as to whether the Pacific Coast sardines would run the Portuguese off the market, or *vice versa*. Apparently it is largely a question of price. Sardines usually come packed in 15-ounce tins. Importers had a good deal to say in regard to the packing of fish. The cases should be marked with the number of tins which they contain, and the net contents; for instance, a case of salmon should be marked 48 15-ounce tins. Locally these cases are spoken of as "48 ones." Tins are distinguished between flats and talls. The former are usually oval and contain 15 ounces, but there are also halves containing $7\frac{1}{2}$ ounces, and quarters $3\frac{3}{4}$ ounces. The sardine tins should come packed in sawdust. Sardine tins are imported with and without keys.

The tinning and sealing of the cans is most important. One importer instanced a shipment of sardines which was badly tinned, in consequence of which the oil leaked out, discolouring the labels and the tins. The result was that it was impossible to sell the goods, so that a considerable loss was sustained. If one tin in a case bursts or leaks, it will probably spoil the other forty-seven, and if sandpaper to remove discolouration is used, it is quickly noticed by the purchaser and immediately raises his suspicions. In matters of this kind the bazaar is very particular and even suspicious, so that to do business it is necessary that the appearance of the goods should be such as not to raise doubts of any kind.

There is a fair market for tinned herrings, particularly when packed in tomato sauce. English herrings, both kippered and in tomato sauce, are preferred to the United States article, and according to dealers the public will pay a slightly higher price for the former, the reason given being that they are better known and have a better reputation.

On the west coast of India sardines are caught and packed. Originally this enterprise was in French hands, the idea being that sardines would there be packed for the French market. However, this enterprise did not turn out to be the success anticipated for it by its promoters, as apparently the French public could not be persuaded that these sardines were the true ones, and consequently would not purchase them. This industry was a few years ago taken over by a Madras firm, who have built up a successful trade, but their product is not able, according to importers, to compete with the foreign article. One hears a good deal about the Swadeshi movement, but if one may judge by the remarks of dealers, it does not extend to canned fish, as the Indian public prefers the foreign article to the local, believing it to be better, although this is denied by the Madras packers.

In Burma the natives obtain a local fish which they make into a preparation called nappi. Apparently the fish is allowed to decay and then made into the form of a paste which is eaten with vegetables. Inquiries were made as to whether Canadian codfish might not find a sale for the purpose of being made into nappi, but dealers were not very encouraging, apparently fearing that the price would be against it. However, as the Burmese, as already stated, are fish eaters, the experiment might be quite worth trying, not only with codfish, but also with tunny fish or other cheap kinds which are shipped from the east coast of Canada.

The sale of canned lobster is exceedingly small, as owing to its price it is confined entirely to Europeans, and then probably to those with good incomes.

LABELLING OF FISH TINS

The question of labelling tinned fish is not less important than that of tinned fruit. Canned salmon should have an attractive bright label, as such a one appeals to the Oriental. This remark however does not apply to tinned sardines, as it is not customary to give them gaudy colours. What has been pointed out, however, by importers is that the labels of sardines should have on them two gold medallions, and the reason given for this was that the first sardines introduced to the market were the Portuguese, and their tins had emblazoned over a black ground two medallions, and consequently the bazaar looked for them on the tins of that particular class of fish. These remarks were made in Rangoon, and it was strongly recommended that Canadian sardines should be similarly labelled, as the Burman is very strong on marks, and as long as he can see the two gold medallions he is quite satisfied that it is the kind of sardine that he wants.

Before leaving the subject of tinned fish, it should be stated that one of the largest importers in India remarked that a distinction should be made between herrings and sardines. He said that the Scotch herrings were labelled herrings "*a la sardines*" to distinguish them from the ordinary sardines. He advised this, to avoid disappointment on the part of purchasers, who might buy on the name. He also suggested that the packing of herrings should be confined to oval tins, and sardines to the small square ones, as the public were used to the latter.

It is very important that Canadian packers should not consider the Indian market from the point of view of their own. The Oriental is an entirely different person from the Canadian, and looks at things in quite a different way, consequently the advice of importers on this side should be carefully considered and always followed where possible. Such a policy not only leads to business, but very favourably impresses merchants in the East. It annoys them exceedingly to come up against the narrow-minded class of exporter, that is the one who cannot imagine other conditions than those which have come within his own knowledge.

FLOUR

As India is one of the largest growers of wheat in the world, one naturally does not expect her to present a market for flour, but this commodity is imported into Ceylon. In the year 1920 the island purchased 352,124 cwt., of which British India supplied about 273,000 cwt., and Australia the balance. Inquiries were received from importers of flour in Ceylon as to the possibility of securing supplies in Canada, with a view no doubt to rendering themselves less dependent upon India and Australia. However, it is not likely that Canadian mills could compete with those of India, nor even with Australia, which is very much closer to Ceylon than is Canada.

One importer stated that he could do with 5,000 or 6,000 packages monthly, and said that he would be very glad to try Canadian flour if it could be brought in at a competitive price. The Sinhalese use wheat flour, and in this they differ from the majority of either Indians or Burmese, whose chief article of diet is rice.

CONFECTIONERY

There is a very good market in India for confectionery of various kinds, but particularly for chocolate creams. Chocolates come almost entirely from the United Kingdom, as the makers in that country seem to thoroughly understand the tropical markets. At the same time it may be stated that the best confectionery sold in India compares very unfavourably with the best Canadian, although it is possible this may be owing to the way in which it is made in order to stand the climate. There seems no reason why Canadian chocolates should not be introduced into this market, particularly in the cool season, which runs from November until about the beginning of March. But it is absolutely necessary that confectionery be contained in hermetically sealed tins of one-half and one pound capacity. One importer thought that it would be satisfactory to pack confectionery in cartons, provided these were again packed in tin-lined cases, but his opinion was not confirmed by others. His idea was that the case being small, when opened the contents would be sold too quickly for them to deteriorate. Chocolates are sold in this country packed in cartons, but there is little question that they do not keep so well as when packed in hermetically sealed tins.

As Canadian manufacturers of confectionery must have gained some experience of tropical markets in the West Indies, they should be able to establish themselves in India. It was put forward as a suggestion, that Canadian manufacturers send out small shipments on consignment to two or three well-known, reliable importers, in order to test this market. This is sound, as while gaining information, it is very likely that at the worst their goods would be sold for sufficient to reimburse them for the outlay.

The imports of confectionery are shown under the heading of sugar and amounted for the year ended 31st March, 1920, to over Rs. 21 lacs, which is a very considerable increase over the two preceding years. For the two months ended 31st May, 1920, the imports amounted to about Rs. 8 lacs, from which it would appear that this trade is likely to be an expanding one. It may be mentioned here that Indians are exceedingly fond of sweet things and consume enormous quantities of sugar in various forms, and it can be said in truth that with the people of this country it is an important article of diet.

The imports of confectionery into Ceylon amounted in the year 1919 to 453,945 pounds. In the Ceylon trade, as with that of India, the United Kingdom took the leading place, British India coming second, but the imports from the latter may have been very largely made up of re-exports. The United States are credited in the year mentioned with 24,931 pounds.

TINNED VEGETABLES

There is a very small market for tinned vegetables, and so far as could be judged it is confined in India and Ceylon to tinned asparagus, which seems, in hotels at any rate, to be looked upon as an extra special dish for particular occasions. As India produces large quantities of vegetables herself, and they grow more or less all the year round, there is little necessity to have recourse to tinned goods.

FRESH APPLES

In Ceylon there is a small market for fresh apples, but according to dealers, the red skinned variety are not popular, preference being for an apple similar to the Oregon Newtown Pippin, which should be wrapped in tissue paper. The yellow-skinned apple sells better than any other, and should be of a size which would run about 120 to the case. India produces in Kashmere and the Punjab a very fair apple, but if cold storage were available no doubt fresh apples would be imported.

EVAPORATED APPLES

Although the demand for evaporated apples, mostly in the form of rings, is not large, at the same time it is fairly steady. These come out from California packed in 2-pound packets, and these again are contained in tin-lined cases, 28 packets to the case. Apparently there is no sale for evaporated dry peaches or apricots, as it is alleged that they turn black in the climate of India.

HONEY, TINNED PASTES, ETC.

The imports of honey are said to be small as it is produced locally. A good deal of honey is consumed by the people of India; they like it as an article of diet, and it is also used for embalming purposes.

The consumption of tinned pastes is comparatively small. Meat and chicken pastes are produced in Canada, and as they are exported to China and Japan there is no reason why they should not find a market in India, such as it is. Meat paste at present is almost entirely imported from the United Kingdom and comes out in 4-ounce tins and glass jars.

Some Canadian sausages have been imported into India, but it is stated that they were too highly flavoured although otherwise satisfactory. On account of this high seasoning, one dealer said that he only sold one tin of Canadian to about 100 of English.

BEER

Large quantities of beer are consumed over the whole of the Middle East. A brand of Canadian bottled beer made in British Columbia is quite favourably known from Japan down the coast to India. For heavy beers the English is of course the most popular, but for light beers the taste seems to be spread over the Dutch, Japanese, American and this one brand of Canadian just mentioned. German beers are being imported once more, and as they are said to be cheap, it is very probable that they will put up a severe competition. However, there is no reason why Canadian brewers should not place themselves in touch with importers in the Middle East, with a view to introducing their products on the market. Although they may not be able to compete with German beers, they should certainly be able to hold their own with Japanese, Dutch, English or American lager and light ale.

WHISKY

So far as could be gathered, the demand for rye whisky in the East is almost nil. The only importer met with who found a sale for it was in Rangoon. He stated that he was able to dispose of a certain amount of Canadian rye, but there was no other dealer who showed the slightest interest in it.

CIDER

There is a small importation of cider in India, which amounted in the year ended 31st March, 1920, to 11,031 gallons of a value of Rs. 64,414.

SOFT DRINKS

There is a very good market for soft drinks in India, and one large importer said he would be very pleased to hear from any Canadian exporter who could supply him with a first-class mineral or other soft drink. To show what can be done, he instanced the case of an Australian beverage which is used as a flavouring to be mixed with soda or with water. This firm apparently were very aggressive, and although at first meeting with discouragements they induced this particular importer to take up the sale of their product, which met with a very considerable measure of success.

TOBACCO

The imports of tobacco in various forms into India are very considerable, and amounted in the year ended 31st March, 1920, to 5,847,712 lbs., having a value of over Rs. 2 crores. Of this, 800,000 lbs. were unmanufactured. The bulk, however, of the importations was in the form of cigarettes, of which the United Kingdom sent 2,960,196 lbs. and the United States 1,164,885 lbs. As this business is important, and Canada should be able to compete either with the United Kingdom or the United States, the question is well worth the consideration of Canadian manufacturers. It might be mentioned that one large importer in Calcutta was very interested in the idea of obtaining cigarettes from Canada. He seemed to think that it would be quite possible for our manufacturers to compete in the Indian market, and he thought it would be all in the interest of trade if a new source for their supplies could be discovered.

CHAPTER IX

The Market for Wood and Timber and Paper

SQUARE TIMBER, PLANKS, BOARDS, AND SLEEPERS

India has very extensive forests, and is able herself to produce large quantities of timber. Formerly quite large shipments of Oregon pine were imported, to be employed in temporary structures for floorings and ceilings, for partitions in railway wagons and steamer holds, and for the manufacture of packing cases. Latterly, however, owing, it is stated, principally to high prices, this trade has greatly diminished—in fact it may be said to have almost disappeared. In addition to these uses of Oregon pine, it has also been utilized after creosoting for railway sleepers, in which form it apparently gave fair satisfaction. California red wood uncreosoted has been tried for this purpose, but judging from observations made by importers, the white ants made very short work of it; but if it were treated, it might give as much satisfaction as the Oregon pine. White pine has been imported into the country, principally from Scandinavia, for ceilings, floors, etc. India is deficient in light wood suitable for temporary structures, and hence the reason that a country with such immense forests is compelled to go to America for Oregon pine and California red wood, and to Scandinavia for white pine.

No timber will withstand the white ant as stoutly as teak, which is obtained in abundant quantities in the forests of Burma, but unfortunately for the railways of India it is too high in price to be used extensively as sleepers, consequently its use is confined largely to the manufacture of furniture. The writer was informed that the most valuable timbers to be found in Burma will not float, and as the heavy railage rates to the sea-coast makes their utilization prohibitive, there is nothing for it but to leave them in the forests uncut, until such time as their exploitation becomes a commercial proposition.

Various opinions have been expressed to the writer in regard to the likelihood of a revival in the trade in Oregon pine square timber, planks and boards and creosoted sleepers. Some dealers are of the opinion that it never will revive, while others express a contrary view. If one were to judge between them, it would be in favour of those who think the trade will pick up, although it may not attain to its former proportions, because they appear to be in the better position to judge, and were men who, though they might be interested in the import trade, had at the same time even larger interests in the production of India.

In Bombay several importers stated that they would be interested in having quotations for square timbers in the following dimensions, 12 by 12, 13 by 13, and 14 by 14,

and in lengths of from 16 to 40 feet; and for planks 16 feet long 12 inches wide, and $1\frac{1}{2}$, $2\frac{1}{2}$, 3, 4, and 6 inches thick. A specification 500-ton order was given to me by one of the largest importers in Calcutta and is as follows:—

12x1 16' and upwards...	50 tons	12x4...	50 tons
12x1 $\frac{1}{2}$...	50 tons	12x6...	50 tons
12x2...	50 tons	12x12 40' and upwards...	150 tons
12x3...	50 tons	14x14 40' and upwards...	50 tons

If creosoted sleepers could be landed in India at a considerably lower price than at present, there would no doubt be a very large market for them; but one of the largest importers stated in conversation that they cost from Rs. 12 to Rs. 15 against the prewar price of about Rs. 6, whereas Indian sleepers could be supplied at about Rs. 7. In spite of these excessive prices, however, he thought there would still be a considerable market for the sleepers from North America, the reason being that the requirements for sleepers for the railways of India would for some time amount to between 3,000,000 and 4,000,000 a year, whereas at the best not more than 2,000,000 could be produced in the country, and making it necessary to supplement the local supply of sleepers. Iron sleepers are now being manufactured in the country, and of course they have a very long life as compared with the timber sleepers, but it is reported that the railways are so short of funds that they cannot afford the larger initial outlay necessary to equip the lines with this class of sleeper.

Sleepers for standard gauge railways should be 9 feet by 10 inches by 5 inches, or if the wood be inclined at all to shrink, a little should be added to the length. Most of the Indian sleepers are produced in the Punjab from the deodar, which is the Indian name for cedar, and from the sal tree. This latter tree grows extensively in the region near the Himalayas, large forests of which are situated in the Darjeeling district, northeast of Calcutta.

It is useless to consider the exportation of Douglas fir or other kinds of sleepers to India unless they have been first immersed in a solution of creosote, and it should be very carefully borne in mind, that this must be done with the very greatest thoroughness, as if the very smallest part be left uncreosoted, it will be sufficient to make an opening for the white ant or the borer, who will very soon eat through into the centre. Wooden sleepers are liable to dry rot, owing it is stated to the extreme wetness of the ground during the monsoon period, which condition is succeeded by one of extreme dryness after the rains have passed.

As direct steamship connections have now been established between British Columbia and India, it is very possible that while this will probably have no effect on the trade in sleepers—which would only be brought out in cargoes—it may be of much assistance to a trade in square timber and planks, which can be carried as deck cargo. One importer with a good deal of experience complained that deck loads of timber, where they had to be unloaded in order to get at the hatches, and then loaded again, were liable to considerable damage from this handling, in addition to which they give an opening for pilfering; but this of course would only apply in the case of a steamer calling at a number of ports before discharging her deck loads of timber.

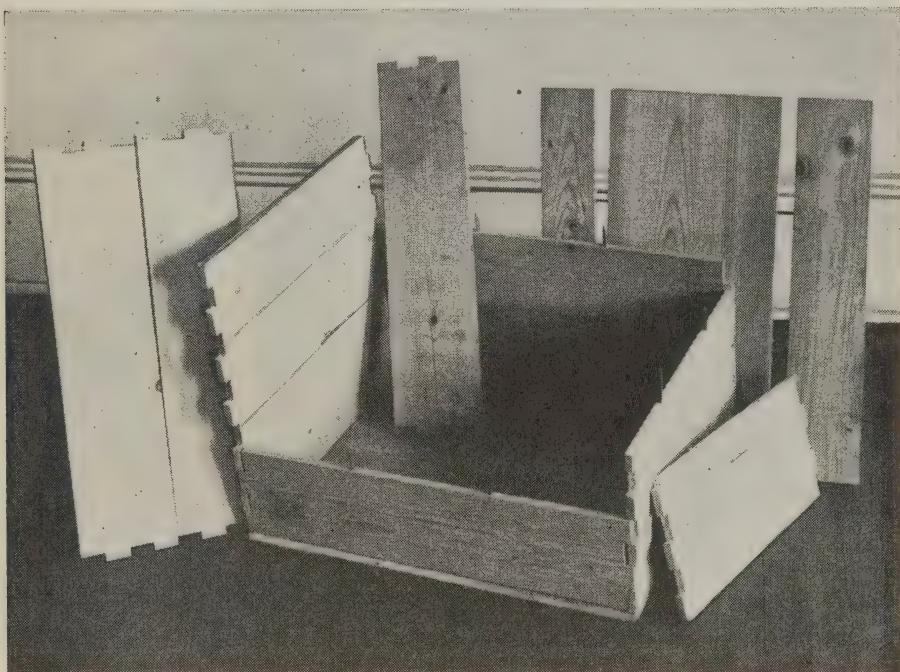
A reference to the trade figures will show that wood and timber were imported into India in the fiscal year ending 31st March, 1920, to the amount of 68,036 cubic tons against 36,780 cubic tons in 1918-19, and 79,916 in 1917-18. The imports for March, 1920, amounted to 5,286 cubic tons. In 1913-14 the imports of timber amounted to 96,000 cubic tons, and those of railway sleepers to 1,990,000 cwt., which figures in the following year had decreased to 76,700 tons and 1,575,000 cwt., respectively. The timber imports into Ceylon are not extensive, and are shown for the year 1919 as 3,380 cwt., with a value of only Rs. 36,165. It is hardly likely that this island can be looked upon as an expanding market for Douglas fir, as although in normal times there is a certain demand, it is not likely to greatly increase.

TEA CHESTS, ETC.

There is a large trade in wooden chests for use in shipping tea, rubber, desiccated coconut, etc., throughout the Middle East, or at least in that part of it which is under review. Although the statistics do not show the countries of origin, it seems clear from the information gained from importers that at the present time most of these chests are being brought in from Japan, under the well-known name of Momi chests.

The outside measurements of this box illustrated are 24 by 19 by 19 inches and $\frac{1}{2}$ inch thick; its contents are 5 cubic feet and it contains from 200 to 225 pounds of rubber. The inside of the box must be planed and the ends dovetailed.

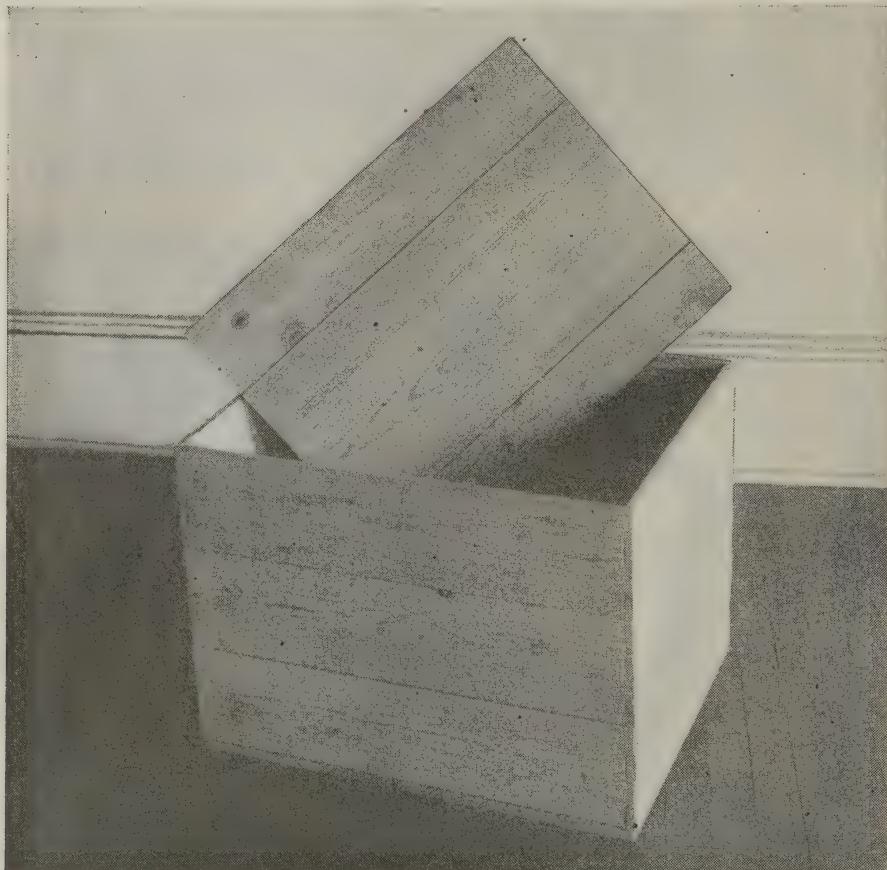
In addition to Momi chests, what are known as Venesta chests have also been imported into India, Ceylon, etc., but at the present time these are so high in price that the trade has dropped to practically nothing. Chests have been imported from Russia (or, to be more accurate, from Siberia also), but these have now been out



Chest in sections showing dovetailed ends

of the market for several years. Japanese exchange is high as compared with the rupee, and it is very possible that this factor will seriously affect the imports of Momi chests from that country, and will drive the planters in India and Ceylon to make use of the local article. One Indian tea planter stated that he was able to manufacture tea chests on his own estate at 1 rupee 4 annas each, exclusive of the cost of nails; but he was in an exceptionally fortunate position as the trees grew on his own estates. He also stated that he preferred these chests, which he made out of the wood called Toon, to the imported article. Although this wood is not entirely odourless, this did not appear to affect the tea. One large importer of tea chests in Colombo mentioned that he had had quotations from Vancouver, but that they were found to be just a little too high for the price ruling then, which was July of 1920. The price

quoted c.i.f. Colombo was 1.25 cents, which worked out taking the rate of exchange at 2.25, at Rs. 2.50 or Rs. 2/8 Indian currency, but he was of the opinion that if this quotation could be reduced to 2.61, a start might be made and at a still slightly lower price a good trade could be done. Since then the rupee has fallen, and this will have the effect of placing the c.i.f. price still higher. Now that tea and rubber



Chest assembled

are suffering acutely owing to the extreme depression of prices, planters will be compelled to use cheaper chests, and although as a rule the imported article is preferred, they will probably be reduced to using those of local manufacture. In Ceylon locally-made tea chests were selling in the summer of 1920 at about Rs. 2 or a little more per chest, but they were considered very inferior to either the Momi or the Venesta chest.

In Ceylon there is a demand for chests in sizes varying from 5 to 90 pounds, which is especially large for the smallest size. Chests suitable for tea can also be used for packing rubber, desiccated coconut, etc.

The wood used in tea chests must be of a particular kind. It must contain no sap which has the effect of corroding the lead, and must be entirely odourless, as otherwise tea, which has the tendency to absorb odours, would become impregnated, and therefore seriously suffer in value. It is also necessary that the wood should be

thoroughly seasoned, otherwise it is likely to warp when packed with the warm tea, which is packed in this condition so as to ensure its absolute dryness, then enclosed in lead and hermetically sealed, for dryness is absolutely essential.

India is said to possess plenty of suitable wood for tea chests, but up to the present the local chest does not seem to have been able to compete successfully with the imported article, or only in abnormal times such as the present. The future may remedy this state of affairs, and India become self-contained in the matter of tea and rubber chests. A large firm of managing agents have erected a three-ply factory in Assam for the manufacture of tea chests, but it remains to be seen whether they will be able to hold their own against the imported product, should exchange rise to its par value, which is two shillings. There are in India two factories making three-ply wood chests for tea packing. At one time Swedish chests were imported, together with some Japanese made of ordinary wood bundled for shipment in shooks. The Japanese have started to make three-ply chests, but these are inferior to the United Kingdom and United States product. About three and a half million chests are required annually to pack the tea that passes through Calcutta and Chittagong for shipment.

BEAVERBOARD

Up to the present there has been practically no demand for beaverboard, as very little has been known about it in India, and those who have been familiar with it apparently have been under the impression that it would not withstand either the conditions brought on by the monsoon or the attacks of the white ants and borers. Canadian beaverboard is now being handled by one of the large firms in Calcutta, and it is fully anticipated that, owing to the manner in which it is prepared, it will prove impervious to the ravages of the white ants. If this proves to be correct, there should certainly be an excellent market for beaverboard for use in cheap construction, and the whole of the trade might very well be secured by the Dominion, and indeed should be.

INDIAN TIMBER

India herself possesses enormous wealth in her timber trees, and it has been stated that in this she is probably unsurpassed by any country in the world—a fact that would not appear to have been widely recognized. Some of the timbers are of rare beauty such as the Indian tulip wood, which is of a soft rose-pink colour tinged with streaks of mauve or purple and very suitable for the manufacture of fancy articles; and Indian yellow wood, of a bright orange yellow colour with dark shades running through it and which has a kind of opalescent translucency. There are many others such as black walnut, rose wood, gurjon (of a brown colour but which when cut in a certain way discloses a very beautiful grain), cutch, sandal, sal, deodar, etc. The forests of India extend from the foot of the Himalayas throughout the whole peninsula, and cover in all some 250,000 square miles—an area embracing nearly 25 per cent of the whole of British India. About half of this area is supervised and controlled by the Imperial Forest Service. That these forests are a substantial source of profit to the Government of India is shown by the revenue, which amounts to somewhere in the neighbourhood of Rs. 2 crores annually, all of which is net.

In connection with the subject of timber, the head of an outstanding firm of managing agents suggested in conversation to the writer that it might be to the advantage of Canadian lumbermen to consider the establishment of auxiliary companies in India, for the exploitation of her wonderful forest wealth. His idea was that as Canadian lumbermen have great experience, they would be fit people to take up lumbering operations on a large scale in the Indian forests, and he was of the opinion that it would not be difficult to form one or more concerns, the promoters of which would be willing, in the allotment of shares, to recognize generously the abilities and experience of Canadian lumbermen.

The most important timber operations in India are carried on in Burma, where there are extensive forests of teak, and where it is said there are more saw-mills than in the whole of the rest of India put together, some seven or eight of which are of a large size. There are also saw-mills in the Punjab, Bombay, the Central Provinces, in the Madras Presidency, and other parts. The unit of sale of timber in India is usually the cubic foot, and 50 cubic feet go to 1 cubic ton.

A great deal of research work is still to be carried on in regard to Indian timbers; for instance, apparently very little is known as yet as to the best methods of seasoning the timber and this is now under careful investigation. The subject of artificial seasoning has also been considered, as up to the present that also has been more or less neglected. One method of seasoning is to circle the trees and allow them to stand from one to three years before cutting, whereas others such as teak are cut and are left immersed in water for a certain length of time. But as most of these methods tie up capital for a considerable period, some means of obviating this is being sought.

Paper

The total imports of printing paper into India for the fiscal years 1917-18, 1918-19, and 1919-20 were respectively 189,875 cwt., 194,603 cwt., and 200,684 cwt., and for the month of March, 1920, the imports were 34,337 cwt. In 1919-20 the United Kingdom supplied 48,410 cwt.; United States, 46,960 cwt.; Norway, 74,914 cwt.; and Sweden, 26,239 cwt. These figures showed some changes from the year 1917-18, when Japan imported 27,106 cwt. whereas in 1919-20 her trade had fallen to practically nothing. The United States and the United Kingdom have largely increased their trade, the former from 17,694 cwt. and the latter from 26,253 cwt. The trade of both Sweden and Norway has slightly diminished.

Considering the position which Canada occupies as a manufacturer of paper, she should have no difficulty in capturing the greater part of the trade in newsprint. A certain amount of Canadian paper is now coming into the market, and the agents say that they can find a ready sale for any quantity up to 500 or 600 tons a month. Printing paper is imported both in rolls and in bales, the larger newspapers taking the former. One of the largest houses in India put the importation of paper in rolls for the whole country, including Burma, at from 4,000 to 5,000 tons per annum.

NEWSPRINT

Newsprint comes out in bales. It is of the same quality as the rolls, and is packed 500 sheets to the ream, basis 18 inches by 22 inches, 8 pounds to the ream. As the statistics show, Scandinavia is still very strong in the paper trade, the business in which is usually done through London, and it is very possible that part of the supplies credited to the United Kingdom originate in Norway and Sweden.

Newsprint is made in India from grass. While anticipations that bamboo may furnish material for supplies have been formed, one of the firms most interested stated that the process is still in the experimental stage. An importer in Bombay, speaking of the Indian newsprint, said that it was very much higher in price than Scandinavian, and that while in August of 1920, the latter was quoted 70 shillings per ton c.i.f. Bombay—which works out at about 4½ annas per pound—one of the largest mills in India quoted him 8 annas per pound Calcutta, which shows a very great difference. In addition to the higher price, the Indian paper would have to pay railage from Calcutta to Bombay.

Unglazed newsprint is employed to quite a large extent for such articles as text books in the vernacular, Bengali almanacs, etc.

Local mills, in addition to ordinary newsprint, make quite a good light-weight unglazed grade of Badami paper, which is a biscuit-coloured paper used for such cheap lines as account books, scribbling pads, and theatre programmes.

It is very important that newsprint exported to India should be well packed. Complaints have been made as to carelessness shown by some United States shippers.

STATIONERY

Imports in stationery amounted in the fiscal year 1919-20 in value to about Rs. 45 lacs; which is a considerable increase over the two previous years; the weight is not given. For the month of May, 1920, the imports were valued at nearly Rs. 7 lacs. The bulk of the stationery was imported from the United Kingdom with over Rs. 23 lacs, while the United States came second with Rs. 13 lacs.

Canadian paper is now known on the Indian market, and it is to be hoped that with the steamship connections which have been recently established, this trade will work up into one of great profit; and considering Canada's exceptional position in this industry it will be unfortunate, if she does not take a commanding position within the next five or six years.

The imports of other kinds of paper amounted in 1919-20 to over Rs. 75 lacs, which is Rs. 2 lacs more than the previous year but Rs. 25 lacs less than in 1917-18. The statistics do not show the countries from which these were obtained, but it can be safely assumed that the principal suppliers were the United Kingdom, the United States, and Scandinavia. Inquiries have been made for book paper, bank paper, and wrapping paper from Canada. Book papers are wanted down to 12 pounds per ream. It is necessary to note that paper which has a watermark must show the country of origin—i.e., there must be incorporated in the watermark the words "made in Canada" on each sheet. As with newsprint, care must be shown in the packing of other classes of paper and where it is contained in cases, every precaution should be taken when nailing down to avoid damaging the contents. The packing of Scandinavian paper shipped to India bears an excellent reputation—a reputation that is borne out in other parts of the world.

So far as Indian competition is concerned one manufacturer stated that he hardly expected that makers would be able to hold their own in newsprint when once business became normal, whenever that might be, or with the highest grade of paper. The product of India is not entirely made from local raw material, but is also manufactured from imported pulp.

Canada at the present time is exporting very large quantities of newsprint and other classes of paper to the United States, of which it is very possible certain quantities are shipped abroad. In view of this, Canadian paper manufacturers might consider carefully whether it would not be to their ultimate advantage to keep this trade in their own hands, rather than that foreign markets should be supplied through the medium of American shippers. This policy would probably in the end be greatly to the advantage of the Canadian manufacturer, would be providing freight for Canadian steamship lines, and have an indirect influence in helping to sell other Canadian products.

The imports of paste boards, mill board, etc., are of considerable importance, being valued at Rs. 30 lacs a year or approximately £300,000.

PACKING PAPER

In this market very little superior packing paper is used, the demand of the bazaar being almost entirely for a cheap make of local paper and for Scandinavian nature brown.

WALLPAPER

The demand for wallpaper in India is unimportant, and although this commodity is not shown separately in the trade statistics, the imports so far as can be judged would not amount to more than Rs. 50,000 to Rs. 70,000 a year. The average Indian does not care for wallpaper, and the vast majority could not afford it. In addition, there are these facts to be considered, that in India wallpaper is considered insanitary as it harbours insects, and that during the monsoon period, which is one of extreme humidity, the paper becomes so damp that it peels off the wall.

OLD NEWSPAPERS

All over the Middle East old newspapers are in demand as wrapping paper in the bazaar. It is impossible to say what the import amounts to, as it is not mentioned in the customs statistics, but judging from inquiries it would probably run to a fair amount.

CHAPTER X

The Market for Iron and Steel Products

PRODUCING COMPANIES

Iron and steel in various forms is imported into India in exceedingly large quantities, as a reference to the statistics will show. At the present time there are three producing companies organized in India: the Tata Iron and Steel Company, a very important concern which manufacture at Jamshedpur, about 150 miles west of Calcutta; the Bengal Iron Company, which make iron, ferro-manganese and iron products at Kulti, some 140 miles from Calcutta on the East Indian railway; and the Indian Iron and Steel Company, which it is expected will commence manufacturing pig-iron about the middle of 1922.

India contains fairly large quantities of coal, mostly situated in the provinces of Bengal, and Bihar and Orissa, and deposits of iron ore, which are said to be almost inexhaustible, are found in Singhbhum district, Chota Nagpur, and in which very large claims have been staked out by the three Indian companies already mentioned. The iron ore is said in certain locations to have a depth of from 2,000 to 3,000 feet, part of which is below and part above sea level.

DESCRIPTION OF IRON ORE DEPOSITS

The following description by Dr. Fermor, of the Geological Survey of India, is taken from the report of the British Trade Commissioner:—

“Dr. Fermor, of the Geological Survey of India, has recently reported as follows on the discovery of the new iron ore deposits owned by the Bengal Iron and Steel Company at Pansira Buru and Buda Buru, in the Saranda forests of Singhbhum, near Manharpur. This discovery may be destined to rank as an epoch-making discovery in the history of the Indian iron and steel industry. With these deposits as a starting point, subsequent prospecting has led to the discovery of what appears to be a range of iron ore, forming a definite geological stratum, in the Dharwars of Singhbhum. Judging from the accounts of reliable geologists in private employ, the iron ore range, rising to heights of 2,000 to 3,000 feet above sea-level (i.e., roughly 1,000 to 2,000 feet above the adjoining valleys), runs almost continuously for forty miles in a south-southwest direction from near Pansira Buru through Saranda into the Keonjhar and Bonai states of Orissa. This iron ore range has been largely staked out by the Bengal Iron and Steel Company, the Tata Iron and Steel Company, the Indian Iron and Steel Company, and Messrs. Bird and Company. The Pansira Buru deposit shows a body of high-grade hematite about 400 feet thick and 1,300 feet long, with a steep dip, down which the deposit has been exposed by quarrying operations for some 500 feet. The ore body plunges to an unknown depth and the ore, according to the Bengal Iron and Steel Company, averages on analysis:—

	Per cent		Per cent
Iron	64.00	Manganese	0.06
Silica	3.00	Phosphorus	0.05

"It is stated that, at one place on one of the concessions of the Tata Company, a ravine cutting across the iron ore range shows a continuous thickness of some 700 feet of hematite running over 60 per cent in iron.

"An officer of the Geological Survey of India has been detailed to make an examination of the whole iron ore range and, if his examination and the results of future development work confirm the present ideas as to the magnitude of this discovery, it is evident that India may be regarded as provided with reserves of high-grade iron ore commensurate with as large an expansion of her iron and steel as may be justified by the requirements not only of India, but of surrounding Eastern markets.

THE FUTURE METALLURGICAL CENTRE

"When one remembers the existence of vast deposits of limestone in Gangpur state to the west and the proximity of the most important coal fields of India, it seems probable the future development in iron and steel smelting in India will be concentrated in or near Singhbhum. These probabilities, combined with the actualities of Sakchi, the successful inauguration of copper smelting by the Cape Copper Company, and the arrangements to smelt the Burmese zinc concentrates in Singhbhum, not to mention such smaller enterprises as those based on the apatite, chromite, wolfram, ochre and clay deposits of this district, make it evident that Singhbhum is destined to become the metallurgical centre of India.

"Whilst the production of iron and steel by the well-established methods of smelting with coke as the source of heat is bound to centre in Singhbhum, the question of producing electric steel and ferro-alloys in Mysore is receiving attention, and should a large hydro-electric scheme be installed near the west coast, as is proposed, the question of smelting the hematitic ores of Goa would also be worth consideration.

"The possibility of treating the low-grade magnetites of Salem has been examined, and it is evident that these quartzose magnetic ores, like the magnetite-apatite rocks of Singhbhum, will, unless smelted in admixture with other ores, be suitable for treatment as iron ores only after magnetic concentration and briquetting."

INDIA'S METALLURGICAL INDUSTRY IN ANCIENT TIMES

The head of one of the largest industrial companies in India estimated that the country had sufficient iron ore to last for thousands of years. India is also well off for the necessary fluxes for the manufacture of pig-iron. The country therefore should be in an excellent position for the manufacture of iron and steel and the products of those metals, within limits. Iron smelting has been practised in India from very early times. Mr. Lees Smith in one of his books on Indian economics states that the manufacture of steel and wrought-iron had reached a high state of perfection at least two thousand years ago, and that the famous iron pillar at Delhi, which is not less than 1,500 years old, is still a marvel. It consists of a mass of wrought-iron, the like of which in modern times could only have been produced by the largest factories. He further says that the famous Damascus blades were finished from iron brought from a remote Indian village which has now passed into oblivion. Indian steel was at one time used for cutlery even in England; yet at the present time India in a commercial sense is only at the beginning of an iron industry. Thus does history repeat itself.

PRODUCTION OF MODERN PLANTS

The Tata Iron and Steel Company, Ltd., produced pig-iron from about the end of 1911, and mild steel was added in the following year. In 1918 the Tatas produced 198,000 tons of pig-iron and 71,000 tons of rails, and they are now working on a contract given by the Indian Government, for 20,000 tons of steel rails annually, which is to extend over a period of ten years. The general manager of the works is an American.

The Bengal Iron Company commenced the production of pig-iron nearly half a century ago, but apparently without success. This company, after suffering many vicissitudes, has grown within the last few years into an exceedingly prosperous and firmly established concern. Its output of pig-iron is at the rate of about 10,000 tons a month. In addition to pig-iron—of which a considerable quantity is exported to Japan and Australia—the Bengal Iron Company manufacture ferro-manganese, cast-iron piping, iron castings, and a number of by-products such as tar, sulphuric acid, and sulphate of ammonia, which go hand in hand with such an industry. It will be of interest to Canadians to learn that the general manager of these works spent most of his life and gained his experience in Canada.

It has been predicted that in another five years India will be producing between 800,000 to 900,000 tons of pig-iron a year, but on present indications this appears excessive. But there are those in India who declare with perfect confidence that before long India will be exporting pig-iron not only to Japan, China, and Australia, as she does now, but to the United Kingdom, the United States, and Canada.

FERRO-MANGANESE

Ferro-manganese has been made in considerable quantities at the works of the Bengal Iron Company, with a guaranteed minimum of 70 per cent of manganese, and phosphorous contents not greater than 0.55 per cent. A small quantity of this is used locally, and the balance is exported. For the fiscal year ending March 31, 1920, the exports of ferro-manganese from India amounted to 506 tons—a very considerable decrease on the previous year, when 10,878 tons were sent abroad. For the two months ending May 31, 1920, the exports amounted to 3,023 tons, of which the greater portion was shipped during the month of May.

In addition to the manufacture carried on by the Bengal Iron Company, ferro-manganese is also made at Jamshedpur. It is produced in India by the blast-furnace method. One authority states that, owing to limitations in the quality of the coke, and the high percentage of phosphorous contents in Indian manganese ores which seems to increase with depth, it is not likely that the country will ever be a large producer of a ferro-manganese with a low percentage of phosphorous contents by the methods at present practised.

IRON AND STEEL PRODUCTS

Very little is heard of Canadian steel in this market, although a certain amount has found its way to India. One firm in Madras stated that they were importing both iron and steel from Canada, and this was one of the few instances where mention was made of Canada in this connection. Considering the huge business which the United States have worked up in India in iron and steel products, there seems no reason why the Dominion, particularly now that direct steamship connections have been established, should not be able to do a considerable amount of business in this market. Imports of steel angles and springs in the fiscal year 1919-20 were valued at over Rs. 52 lacs, and the imports of steel bars and channels at over Rs. 2 crores, of which the United States exported no less than Rs. 1,08,00,000, or about £1,000,000. Of the total of bars and channels imported, the United Kingdom supplied a value of about Rs. 74 lacs. The trade for April and May, 1920—the first two months of the financial year—amounted to 28,421 tons, of which the United Kingdom supplied 18,000 and the United States about 4,500 tons. Possibly the reason for the change over was due to the industrial troubles to which the iron and steel industry in the United States was subjected during 1920.

Canada has competed in Japan and China in steel bars, and is possibly doing so to-day; accordingly our steel mills should be able to do equally well in India. It is very likely that the supplies sent into this country will continue to be heavy if

not to expand over a number of years. One firm stated that if they could be assured of receiving supplies from the Dominion they would be prepared to take 30,000 tons of mild steel a year, spread over girders, bars, angles, tees, rods, plates and sheets. Importers stated that there is a very good market for tool steel in squares, rounds, flats, hexagonals and octagonals, $\frac{1}{4}$ inch to 3 inches. There is a certain amount of faggot steel imported into Burma, and possibly into other parts of India. In the former country these are manufactured into big knives called Dahs, which are almost always carried by the jungle natives. These knives are also made of bar iron and edged with Milano steel.

In connection with the steel business, it should be mentioned that a good deal of it is done on a consignment basis—in fact the head of a very large importing house stated that practically all British steel manufacturers do a consignment business in India, and the same remark applies to wire rope.

American steel manufacturers appear to be very determined to make themselves supreme in the Indian market, and some of them have opened up their own offices. It is understood that the largest of these will carry heavy stocks, and supply their customers from their own godowns, as is their practice in other parts of the world. This is undoubtedly a sound as well as an aggressive policy, and one that will probably be very well rewarded in the future.

GALVANIZED IRON SHEETS

The importation of galvanized iron plates and sheets, both corrugated and plain, were valued in fiscal year 1919-20 to Rs. 2,30,00,000, which was a huge increase over the two previous years. A glance at the trade figures shows that the United Kingdom is absolutely supreme in this commodity, the exports increasing from Rs. 8 lacs in 1918-19 to over Rs. 2 crores in 1919-20, whereas the United States only increased their trade from Rs. 6 lacs to Rs. 12 lacs.

The market in galvanized iron sheets requires most particular attention. The British corrugations are from $1\frac{1}{8}$ inch to $1\frac{3}{4}$ inch deep, and are preferred to the American article, in which the corrugations are shallower. Both British iron and American iron is 32 inches in width, and both sheets have ten corrugations. The point in favour of the British product is that there is a margin of $1\frac{1}{2}$ inch on each side beyond the outside corrugation, which amounts to having a half corrugation on each side, whereas the American makers have skimped this outside margin. In discussing this subject, the head of one of the large importing firms pointed out that with the very heavy rains experienced in India, accompanied often by high winds, anything less than a lap of $1\frac{1}{2}$ -inch corrugation at the sides of the sheets, and 6 inches at the ends, is insufficient for galvanized corrugated iron roofs. He stated that he was speaking from an extensive experience of tea gardens, where galvanized iron is practically the universal roofing material for factories, godowns, leaf houses, and even bungalows. It must be borne in mind that the rainfall on tea gardens in parts of Assam, and in the sub-Himalayan tracts, is from 150 to 200 inches per year, and very often comes down in quantities that would almost seem inconceivable to Canadians. Before the war Belgian galvanized iron was very largely imported, and it probably will be again, but at the time of writing the competition from that country has not become severe.

Corrugated sheets come out from the United Kingdom marked in the following manner: first, length is given, and below that the number of sheets per bundle, as for instance, 6-12, 7-10, 8-9, 9-8, or 10-7. These bundles are made up to an average weight of $1\frac{1}{4}$ cwt. and are secured with three corrugated iron hoops $1\frac{1}{2}$ inch by $\frac{1}{8}$ inch, and it is necessary that the bundle be marked with the brand, the weight and size. Consignees claim all shortages but do not pay for overweight. Corrugated sheets, in addition to being used on the tea gardens, as already stated, are also largely used in jute mills along the Hooghly river, and as roofing for small factories, coolie quarters, etc.

One firm in Rangoon stated that they had had corrugated iron from Canada, but this was the single instance met with, although it is possible that others may have imported it without the fact having been stated to the writer.

BOLTS AND NUTS

Bolts and nuts are made in India near Calcutta, but as the figures show, this local industry is not able by any means to supply the requirements. The imports for the fiscal year 1919-20 amounted to nearly Rs. 26 lacs, of which the United Kingdom supplied to the value of about Rs. 14 lacs, the United States about Rs. 10 lacs, and Japan a little over a lac. It is interesting to note how the trade of the United Kingdom jumped up in the year referred to, while that of the United States and Japan, and particularly the latter, fell away. Apparently Canadian bolts and nuts have come into this market, as one dealer stated that he had handled them, and that they were quite satisfactory. He mentioned that the packages were a little short in weight, being 112 pounds gross instead of 110 pounds net, the latter being the weight to which the Indian market is accustomed. Owing to the simplicity of the process of making bolts and nuts, it seems very likely that India will in time supply herself with these articles, although whether she will be able to compete with concerns that manufacture quantities ten or twenty or thirty times as large as any that are made in the Peninsula, remains to be seen.

NAILS

The import of nails, other than wire nails, rivets and washers, is fairly considerable, reaching for 1919-20 to a value of Rs. 44 lacs, although that was just about a third of the trade of the year before. Manufacturers in the United Kingdom and the United States easily lead in this trade, but the two Scandinavian countries were able between them to supply something over Rs. 9 lacs. The statistics bear out what the importers stated, that there is a huge business in rivets. These are chiefly imported from the United Kingdom. Rivets are also made in India. One importer showed a sample which he said was 20 per cent cheaper than the foreign article, and quite as satisfactory, but that the local works were not able to supply the demand. There is a good market for rose nails, and also for dowel and jagged nails.

PIPES AND FITTINGS

The trade in piping is valuable, the imports amounting in 1919-20 to 10,499 tons of cast iron, and 35,648 tons of wrought iron. The former had a value of nearly Rs. 34 lacs, and the latter of nearly Rs. 2 crores, or together a total of about £2,000,000. Cast iron shows an increase and wrought iron a very considerable increase, over the two previous years, the imports for which were respectively cast iron 7,667 and 6,998 tons and wrought iron 12,359 and 14,308 tons. For the first two months of fiscal year 1920-21 these amounted to 3,895 tons of cast and 6,368 of wrought iron piping.

Cast iron piping is manufactured in India by the Bengal Iron Company, but if wrought iron piping is also made, it must be in very small quantities. The Bombay Port Trust are undertaking extensive works in connection with the port and city, for which enormous quantities of cast iron pipes will be required; and there is a demand for black galvanized iron piping, and for steel piping—all of which have at various times been purchased from Canada. Canadian wrought iron tubing has also found its way into this market. The demand for wrought iron tubing, black and galvanized, is in sizes of from $\frac{3}{4}$ -inch up to 6-inch. These are imported from the United Kingdom and the United States, in almost equal quantities, although the former seems to be regaining her old place at the expense of the latter. Wrought iron piping is used in India for gas and for steam, the former painted black and the latter red. The red piping has the word "steam" painted on it. Wrought iron galvanized pipes are also used for conducting water.

HOOPS AND STRIPS

The business in hoops and strips is a huge one, amounting to 28,000 tons for the fiscal year ended 31st March, 1920, which is an increase over the two previous years. The imports for the months of April and May, 1920, amounted to 3,861 tons. There is a great demand for these strips for use in connection with tea and rubber chests, and they are also used in baling jute, etc. The United Kingdom is the chief supplier, with the United States a fair second.

WIRE, PLAIN, BARBED AND WOVEN

The total imports of wire for the fiscal year 1919-20 amounted to 6,395 tons, which is a decrease of about 1,000 tons on each of the two preceding years. The supplies brought in for the first two months (April and May) of the present fiscal year amounted to 1,231 tons. There is a considerable demand for fencing wire, and also for woven wire. Fencing wire is used on tea estates, and on Government farms, etc., but the lands of the peasants are not fenced in, as they are much too poor to afford it. One importer expressed the opinion that the demand for woven wire fencing will continue to be constant, as it is found to be most useful for the purpose for which it is required, principally keeping out pigs, goats and vermin from the tea gardens. On each tea estate large numbers of coolies are employed, most of whom keep cattle, pigs and goats, and it is as a protection against the depredations of these animals that so much of the woven wire fencing is used. In other parts, where there is no likelihood of these animals breaking through, the gardens are usually fenced with barbed wire, although where they abut on the jungle, protection is not considered necessary.

It is pleasing to note that Canadian woven wire fencing has firmly established itself on this market, and is probably more used than the make of any other country, although very few in India are aware of the fact. There is a certain, but by no means extensive, demand for wrought iron gates. One dealer was very interested in a gate which he had seen in Canada, which opened automatically on approach, and was anxious to obtain one.

Wire netting, which should be painted green, is in considerable request. This is imported from the United States in 12, 14, 16 and 18 mesh, 3 feet wide, and in rolls of 50 feet, and also 8 by 8 to the inch—which latter is used for rice mills. On tea estates a good deal of 19 gauge wire netting is employed in the withering houses, $\frac{1}{2}$ and $\frac{3}{4}$ mesh and 3 feet wide.

Canadian wire is well known in this market, but appears to be considered by the dealers to be somewhat dull in appearance. One large importer stated that the prewar German wire was the very best he had ever handled, but in his opinion the article turned out in the United States to-day is exceedingly satisfactory, and one point upon which he was very strong was that the packing of the latter was the best in the world.

GALVANIZED AND BRASS WIRE SCREENS

Galvanized and brass screens are in some demand by tea estates for use in the machines for sifting tea.

WIRE NAILS

In the fiscal year ended March 31, 1919-20, 6,689 tons of wire nails were imported and in the first two months (April and May) of the next fiscal year, the figures amounted to 490 tons. American wire nails appear to have been favoured more than any other, although the figures for the first two months of the fiscal year 1920-21 show that out of the 490 tons imported during that period, the United Kingdom supplied 374 and the United States only 15. Canadian nails are very well known but are not thought so well finished or well polished as the American, which in a

market like India, where appearances count for so much, militates against their sale. Very large stocks of wire nails are carried by the principal importers, and one of them pointed out in his godown no less than 12,000 kegs. Unfortunately several shipments of Canadian nails arrived here some time ago, and, owing probably to mishandling in transhipment, the kegs on arrival in Calcutta went to pieces. The consequence of this was that the importers suffered a considerable loss, one of them putting it as high as 50 per cent, although that is probably somewhat exaggerated. With regard to the appearance, the difficulty does not lie so much with the ultimate consumer as with the bazaar merchants, who profess fear that if the nails are not bright their customers will not take them off their hands.

There is a good market for nails for horse shoes and also for bullock shoes between $1\frac{1}{2}$ to $1\frac{1}{2}$ inches.

All wire nails arrive on the market packed in kegs containing 100 pounds net, but it was stated by one or two importers that there seems no reason why they should not come out in cases of 45 to 50 pounds. Referring to American packing, one importer drew attention to some kegs of American nails to prove his point as to the excellence of their method. These kegs had wire hoops at the top and bottom, and other hoops four inches from each end. The ends of the wire were firmly twisted together and the hoops, which were fixed with staples driven in at intervals, had apparently been hammered over the ends of the keg. The breakages among American kegs are said to average not more than 1 per cent. Apparently the bazaar prefers wire nails with chequered heads.

STAMPED METAL

There does not appear to be much demand for stamped metal, either for ceilings or any other purpose. Very possibly the reason of this is that it is not known, or has not been properly put up, or when put up has not been cared for and kept painted. One of the principal hotels in India has a stamped metal ceiling which is anything but a good advertisement for this article as it has not been well put up, is badly painted, and inclined to separate in parts. In addition to ceilings, there is a market, probably a small one, for ridge capping, guttering, skylights, etc. Metal ceilings are used to some extent in moving picture houses. In Madras one importer stated that the demand was good, as Indians who have recently made money purchase these ceilings to beautify their houses, but the market cannot be more than a comparatively large one. Stamped metal is being brought in from Melbourne, Australia, and from the United Kingdom, but very little seems to originate in the United States. It is quite possible that if an aggressive campaign were undertaken, and a certain amount of advertising done, a market could be found for this article, or perhaps better said, that the present one could be expanded.

SCREWS

The imports of screws into India for the fiscal year 1919-20 amounted to 13,082 tons, which is a decrease over the previous year. So far as could be learned, screws are very largely imported from the United States. As in the case of wire nails, large stocks of screws are carried, and in the godown referred to which contained the large stocks of nails, there was held £10,000 worth of screws.

EXPANDED METAL

There is a considerable demand for expanded metal, in connection with ferro-concrete buildings, and as this is made to great advantage in Canada, manufacturers should endeavour to establish themselves in this market. In India this material is found to be economical in the construction of floors, walls, etc., not only as it

saves labour, but also space in the buildings. One point that was brought out in conversation in regard to this article was that the packing should be very carefully studied, as it was most necessary to protect the edges while in transit. With this object in view, it was recommended that diagonal cross-bars should be fastened at each end to protect the edges, as it was this part that was liable to suffer most.

There is also a very fair market in India for metal lathing of various kinds, and it is likely to be an increasing one.

CHAPTER XI

The Market for Agricultural Machinery

Considering that about 70 per cent of the population of India are dependent upon agriculture and that modern implements and machinery are not made in the country, the imports seem ridiculously small, only amounting in the fiscal year 1919-20 to a little over Rs. 20 lacs, or say at the normal rate of exchange to £200,000. But these figures show a considerable increase over 1917-18, when the imports were only about £100,000. In addition to these figures, no doubt the Government also imported agricultural machinery, but as they are lumped in with hardware and cutlery, it is impossible to say just what they are, but it is more than likely they would be small.

The agricultural implements used in India are of the most primitive kind, and it is not improbable that they vary but little from those in use a thousand years ago; certainly they could not be much more simple. The following extract from Volume III of the *Indian Empire* is inserted, as it throws a good deal of light on the implements in use by the ryots of India, and is therefore likely to be of interest not only to Canadian manufacturers, but also to any one seeking information in regard to Indian life and customs.

“ Indian tillage implements are generally few, simple in construction, and indigenous in pattern, for in a country of small holdings, poor cultivators, and very cheap labour there is little scope for labour-saving appliances. Those of some districts are more varied in kind and more effective than those of others, and the use of such patterns can in some cases be advantageously extended.

THE NATIVE PLOUGHS

“ The plough is the principal implement, and is in many parts of India practically the only one used for preparatory tillage. There are many kinds, varying in weight and effectiveness, but the general pattern is the same for all. The part that penetrates the soil is a wedge-shaped block of hardwood. The draught-pole projects in front, and to it is attached the neck-yoke of the bullocks, while a short, single upright stilt behind serves as a guiding handle. The point of the wedge (to which an iron share is usually attached) loosens the soil to a depth which varies with circumstances, while the body of the wedge moves the loosened soil but does not invert it. In moist soil the plough works like a single-tined grubber. If the plough is light the tillage is superficial, and the ground has to be gone over many times before the desired tilth is obtained. All Indian ploughs are not, however, light: there are many patterns intermediate in weight and effectiveness, between the small plough which the Bengal cultivator carries afield on his shoulders and the cumbrous Deccan implement to which four or six pairs of oxen are yoked. The latter is used in a fair season to bring up black soil into huge clods, and penetrates usually 10 to 12 inches. Thousands of iron turn-furrow ploughs have replaced these heavy indigenous ploughs in the black soil-plains of Madras, and some also are in use in Bombay and the central provinces, but where light ploughing is sufficient the cost of iron ploughs militates

against their adoption. In the alluvium of northern India a light plough with an iron soil-inverting mouldboard, drawn by draught-pole and neck-yoke, has been found useful. The hackneyed statement that an Indian plough merely scratches the surface is correct only as regards some tracts. Over the greater part of India a light plough is used for sowing seed. A bamboo seed-tube is attached to it, and the seed is dropped by hand through this tube as the plough works. The seed falls into the shallow furrow and is covered by the soil moved in making the next furrow. The seedlings do not come up in accurately straight rows, and some hindrance results to interculture, especially where the spacing of the groups would make it possible to use a bullock-hoe. The statistical returns for 1903-04 give the number of ploughs in British India outside Bengal as about 14,000,000. In Bengal complete figures are available only for four districts.

THE DECCAN SCARIFIER

"The scarifier is unknown in northern India, but is extensively used throughout the Deccan trap tract. The part which does effective work in loosening the surface soil and in eradicating weeds is an iron blade of varying length and shape. It is usually 3 feet or less in length and $2\frac{1}{2}$ to 4 inches wide, with the cutting edge sharper than the outer. The blade is fixed by two wooden or iron stays to a horizontal beam which forms the headpiece of the scarifier. To complete the implements a draught-pole and neck-yoke are required, with a stilt or handle to guide it. The scarifier is used extensively during the hot weather as a substitute for the plough, and also follows the plough to prepare the seed-bed. When at work the wooden headpiece passes over the surface and acts as a very effective clod crusher, while the blade, working below the surface, loosens two or three inches of soil, and raised weeds to the top. A heavy scarifier, drawn usually by four bullocks, is used with great advantage on black cotton soil in the hot weather. This soil cracks under the influence of a burning sun, and an inch or two of the surface also becomes friable. The scarifier loosens a little of the underlying hard layer, and through its action a good deal of the friable surface soil filters into the gaping cracks, so that every year a fresh layer is exposed for the reception of seed. A light scarifier is generally used after the seed-drill, to cover the seed and level the surface.

NATIVE SEED-DRILLS

"Seed-drills are used in the same tracts as the scarifier. They have a stout wooden headpiece which, like that of the scarifier, gives support and attachment to all other parts; and the pole, yoke, and guiding handle are secured in exactly the same way. Coulters are set obliquely at varying distances in the headpiece. A hole is drilled in each coulter, into which a bamboo tube is inserted. These tubes as they rise incline towards each other and meet about 3 feet from the ground to support the seed-bowl. Each tube communicated with a perforation in the seed-bowl, and bowl and seed-tubes are supported by ropes. The seed is fed by hand into the bowl. Two men are usually required for this implement—one to guide the bullocks and the other to sow the seed. At work, the coulters cut furrows into which the seed drops before the soil falls back, the covering being completed by a light scarifier. In sowing mixed crops the seed is either mixed in proper proportion before sowing, or that of the subordinate crop is sown through a separate seed-tube, attached to the drill by means of a rope and guided along the track made by one of the coulters. In Gujarat many cultivators are extremely skilful in sowing seed with a drill. Cotton, for instance, is sown in accurately straight equidistant rows. The seed-drills which are used for sowing *rabi* crops on black soil are heavier than those used for *kharif* crops, so that, in the absence of rain, the seed may be deposited in a moist layer and thus germinate properly.

"The use of a seed-drill economizes seed and saves much hand labour in weeding. Where the spaces between the drills are wide, it also permits the use of bullock-hoes.

which are constructed in precisely the same manner as the scarifier but on a miniature pattern, the blades being from 7 to 15 inches in length, according to the distance between the rows of crop for which they are intended. Bullock-hoes are worked in pairs drawn by one pair of bullocks but each implement is guided by a man. The blade of each hoe cuts weeds and stirs the surface soil between the rows of growing crop, these beneficial operations being repeatedly and expeditiously performed at little cost.

"A three or four-coulted seed-drill, with the seed-bowl and seed-tubes removed, is sometimes worked like a light-grubber or harrow; and a similarly constructed implement, with the tines closer together, is used as a harrow in the Madras and Bombay Presidencies. The hard wooden tines are a foot or less in length and are sometimes, but not always, tipped with iron. Levellers and clod-crushers are used to smooth the surface before sowing, and also to conserve moisture. They consist in many cases of a rectangular beam of wood drawn by one or more pairs of bullocks; in Bihar the beam is sometimes hollowed so as to give two sharp edges. The plank is drawn by a pair of bullocks, and the driver stands upon it to increase its effective power.

NATIVE AGRICULTURAL HAND IMPLEMENTS

"The hand-tools used in different provinces for specific purposes vary considerably in pattern. In Madras heavy soils are dug with a crowbar. These soils, as has been said, crack in the hot season, and the crowbar is inserted adroitly into the cracks and huge clods are levered out. In Bombay and Central India the Vaddars (professional diggers) use a strong blade of steel 15 to 18 inches long, and about 3 inches wide at the point. The blade is fitted, like a hoe, to a powerful hardwood handle 3 feet long. This implement is used with great effect on black soil when it has cracked. The tool used all over the country for purposes served in Europe by a spade or shovel has no appropriate English name. In northern India it is called *kodqli*, in southern India *mamuti*. It consists of an iron blade of varying width fitted to a wooden handle with which it makes an acute angle, and it is worked by the arms with the blade pointing towards the workman. Native picks vary in size and shape, and some of them are quaint in design. The original pick was made from the forked branch of a hardwood tree, and picks of this character are still extensively used in forest tracts. The indigenous iron pick is of very much the same shape, while its size depends upon the use it is put to. A small pick is used for lifting potatoes, *tumeric*, onions, and crops of that class. Picks of English pattern have been so extensively introduced for railway construction and on relief works that they are coming into somewhat general use.

"Sickles used for reaping grain crops or for grass cutting are all of much the same pattern. Some are saw-edged. A wornout sickle is cut down and shaped to make a serviceable weeding hoe (*khurpa*)."

There is no doubt that the lack of machinery among the peasants and their consequent lack of knowledge in its use is one of the greatest drawbacks to improvement in Indian agriculture. While a certain amount of modern machinery is imported, in relation to the enormous number of people who live by the soil, it can be said to be practically negligible.

SCOPE FOR MODERN AGRICULTURAL IMPLEMENTS DISCUSSED

It is exceedingly difficult to form an estimate as to the probable increase in the use of modern agricultural implements and machinery in India in the near future. Opinions have been sought from a number of importers, agriculturists, Government officials, and so forth, on this subject, but they have been so contradictory that in the end one is left in a condition of uncertainty.

To arrive at any conclusion, it was necessary to sift opinions. It appeared to the writer that those who were sanguine as to the adoption in the near future of modern methods were the ones who had given most study to the subject and were closest in touch with the agricultural population. Naturally these opinions vary to some extent, according to the parts of the country in which they were expressed, some being better adapted for modern machinery than others. The Indian peasant or ryot is intensely conservative, but at the same time, so far as one can judge from reports, he is susceptible to demonstration and to explanation; in fact, there are those who say that he is most ready to adopt improved methods of cultivation if provided with the necessary means. But it is this very question of means which presents the great difficulty, in fact an insuperable difficulty in most cases, and there seems little hope of this state of affairs being removed, unless it be through the means afforded by co-operation.

MOST SUITABLE AREAS FOR THEIR SALE

The districts which would seem to present the best opportunity for the sale of modern machinery are Madras, the Punjab, the Central Provinces, the United Provinces and Isombay. Although Bengal is one of the largest and most populous of the provinces, rice and jute being its principal crops, owing to the conditions under which these are grown, it does not seem likely that much can be done in this province, or at least for the present. In Madras and Bombay several dealers were optimistic as to the expanding use of tractor ploughs. The need of this Presidency appears to be for a tractor plough suitable to the heavy black cotton soil and which will be able to plough a furrow 8 to 10 inches deep and to turn the sod so completely that it will not fall back into the furrow. One feature strongly operating against the use of tractors in the greater part of India is, that the holdings of the ryots are exceedingly small and as irrigation is practised over the greater part of the country, their plots are surrounded with low embankments of earth to hold the water. Under these conditions, of course, it is practically impossible to use tractors, although it is highly likely that a way could be found if other difficulties did not present themselves. Where the tractor is likely to have its maximum use is in the breaking up of new ground for sugar, tea and coconut estates and for ploughing the larger farms which are to be found in the Punjab.

DEMONSTRATION ABSOLUTELY ESSENTIAL

Several American manufacturers are showing a great deal of enterprise in pushing the sale of tractors in India, Ceylon, and in fact throughout the whole of the Middle East, and they are performing a considerable amount of extremely useful work not only in experimentation but also in demonstration. It is only by the latter that the native of India will ever be brought to the use of modern machinery. One large firm in Madras, firmly convinced of the value of tractor ploughing, was very optimistic as to its future in that part of the country. The head of this firm stated that they had ordered 30 tractor ploughing outfits from the United States for the purpose of clearing a large tract of alluvial land. Their idea was that after the land had been put into shape, they might undertake ploughing contracts for zamindars and ryots. After the first demonstration on their estates, half a dozen of the neighbouring peasants who, having heard of it, had come over to see the operation, begged that their land might be ploughed for them in a similar way. Every day about 50 ryots came from far and near to watch this ploughing—which fact bears eloquent witness to what has been said above, that, although a ryot may be conservative and must necessarily be ignorant, he is not opposed to the introduction of modern systems. Tractor ploughs will enable them to cultivate sugar cane, ground nut and cholum, which is a form of millet and very suitable for cultivation on black cotton soil. The field for tractor ploughing is inexhaustible and this firm thought it

possible that by this means two crops a year might be reaped. It should be said, however, that Madras is probably more advanced than any other of the provinces, certainly more so than most. The outfit employed by the firm referred to was a three-furrow plough attached to a caterpillar tractor, but they were ordering six-furrow ploughs with new tractors which were on their way out.

FUTURE OF TRACTOR PLOUGHES

The Director of Agriculture of the Madras Presidency was also very sanguine as to the future of tractor ploughing. He admitted that small fields presented a barrier to modern methods, but he thought that in time the difficulties would be overcome, and he seemed quite confident that by demonstration it would be proved to the agricultural population that it would be profitable to adopt modern methods. It will be in the hope of obtaining that profit that the change will come, as whatever else the ryot may be, he is very keen to improve his condition financially.

In Rangoon importers were of the opinion that while tractor ploughing had no scope in Lower Burma, it was adapted for use in Upper Burma, for the cultivation of wheat and cotton. The head of one firm of managing agents in Rangoon has exemplified confidence in the practicability of tractors by introducing them on two or three estates for use in the cultivation of paddy, millet, sugar cane, peas and beans. The experience gained had further convinced his firm of the advantages of using the machine, and he expressed himself as confident of its early extended use by all agriculturists who are cultivating on anything approaching a large scale.

A machinery expert, the representative of one of the largest implement manufacturing concerns in the United States, was also most optimistic as to the possibilities of the use of modern machinery. He compared the Indian ryot to the Russian moujik, and quite unfavourably to the latter. As he pointed out, demonstration in Russia had led to an enormous use of machinery, and he saw no reason to doubt that in time the same thing might take place in India. This was his opinion, although one had to confess that it conflicted very sharply with the ideas of many others who possibly have had considerably more experience of life in India. One large importer stated, however, that five years ago inquiries for agricultural machinery were extremely rare, but now they come in by every mail. One reason advanced for the immediately extended use of agricultural machinery is the shortage of labour.

SHORTAGE OF LABOUR ON FARMS

It seems almost ridiculous in a country with a population numbering 315,000,000 that it should be possible to discuss such a thing as shortage of labour, but nevertheless such is evident, as is fully borne out by the remarks of those who are entitled to speak by their experience and knowledge. The reason given for the shortage of labour on the farms is that education is giving the rising generation a desire for town life, and that further, the immense expansion of Indian industries has had the tendency to draw labour away from the farms, which is a condition exactly similar to that experienced by many other countries, notably Canada and the United States. In the past when there were no railways, the labourer in India was born, brought up and died in his village without probably ever having travelled a distance of more than ten or twenty miles from it. Communications were difficult, so that travelling was discouraged; but in these days of cheap railway travelling in India, the spread of education and the rapid dissemination of news, the villager is beginning to take an interest in outside affairs, and is not slow to realize that he can make higher wages in the towns than he can in the country, although he may be too ignorant at the present to realize that the higher wages bring him neither added comfort nor an improved social condition. Perhaps if one were to go to the very root of the question it would be found that there is not so much a shortage of labour—for in India

men, women and children all work, or nearly all—as a shortage of energy, which may be to a certain extent the result of laziness, but which is also due no doubt to the effects of malaria, under-feeding and a number of other causes. But whatever may be the reasons, the point to be brought out here is that there is a shortage of labour or that a sufficiency of labour is not forthcoming at the present time for the needs of agriculture, and if this condition continues it will undoubtedly compel the greater use of labour-saving machinery.

INTRODUCTION OF MODERN AGRICULTURAL MACHINERY

In order to induce the ryots through, say, co-operation to adopt modern agricultural methods, it will no doubt be necessary to commence with the very simplest implements.

It must be remembered that the mind of the ryot works slowly, and therefore the plan adopted by the agents of an English manufacturing firm is probably the most helpful—to start him with a plough which is slightly better than the one he has been using. Before the war such a plough was sold for about Rs. 6, and nothing could be simpler in construction. Having appreciated the fact that this implement was an improvement on his old primitive contrivance, his mind was then prepared to receive a still wider impression in the form of a still better plough, but which was still of simple pattern. And it is thus by easy gradations that in time, providing nothing untoward occurs to check progress, the ryot will be brought to the full use of modern machinery. One thing that must be constantly borne in mind is that the ryot is poor, with a poverty that would seem almost incomprehensible to a Canadian farmer. Even the plough which was sold for Rs. 6 before the war, and which to-day would probably cost double that, is beyond the means of the vast majority. People in the Western world have no idea of the dire and abject poverty of the peasants of India. And what makes matters very much worse is that owing to the tendency of these people to borrow money they very early in life fall into the clutches of the money-lender, and from then on live in what is nothing less than a form of slavery, as once in the hands of money-lenders, these vampires take very good care that the borrowers never free themselves. With his happy-go-lucky ways on the one hand, and the usurious exactions of the money-lender on the other, the wretched ryot rarely has two annas that he can call his own. It is well that Canadian manufacturers should understand these conditions, as it will enable them to appreciate a good many things in India which might otherwise be somewhat puzzling, if not indeed incomprehensible.

There is one thing in connection with the eagerness of the ryots to improve their condition—or perhaps better said to make more money, although it may amount to the same thing in the end—one modern machine or implement in the hands of a farmer is the means of affording an object lesson in its utility to all his neighbours. One modern plough in a community should in time convince the remainder of the villagers that it is infinitely more efficient, and eventually more profitable, than the implement he is accustomed to use, which does little more than tickle the surface of the earth, and which has been employed from ancient times. The Indian with his primitive implement must go over and over the ground, perhaps ten or even twenty times, until the earth is stirred up to his satisfaction, whereas with a modern steel plough and a steel harrow the same work, or very much better work, could be performed in one-tenth of the time, and with infinitely less effort, not only for the farmer himself, but also for his cattle.

PLOUGHS

The plough which would seem to be the most suitable for the use of the peasants is a light steel one capable of being drawn by a couple of bullocks and easily handled by one man. But in addition to the demand for a light steel mouldboard plough, there is also one for disc ploughs of the two-furrow type. Before the war Canadian

ploughs were imported into this market, but it is not possible to tell from the statistics whether this is the case at present, for amongst imports no mention has been made of the present importation of Canadian implements. Some say that the native plough is most suitable to the ryot, but that is absurd. One expert, whose opinion is worth the highest consideration, stated that wherever a native plough could be used a steel one could be used to better advantage. Canadian ploughs are not in evidence on the market to-day, and this is unfortunate, as although they may not be suitable for the poorest class of peasants, they would no doubt find a sale in the Bombay Presidency, Punjab, and in the Central Provinces, where modern implements and machinery are more in use than in other parts of the country. A few light Canadian harrows are to be found, and it is said they are very suitable to the needs of the small cultivator. It may therefore be hoped and anticipated that the trade in this class of implements will increase.

It is very probable that tractor ploughing will show more rapid expansion than the use of the ordinary mouldboard or disc ploughs on small estates, as the former will be in demand by companies who undertake cultivation on a large scale. At the same time it is likely that the demand for steel ploughs, harrows, reapers, and mowers will show a steady increase.

HARVESTING MACHINERY

The demand for harvesting machinery is small, and is confined almost entirely to the Punjab and Central Provinces, where wheat is cultivated on a large scale. It is in these regions that the increase in this class of machinery may be expected.

Even in the provinces just mentioned where wheat is grown the use of threshing machines is extremely limited, and is confined almost entirely to large estates. So far as can be gathered, what demand there is for threshing machines is for one of a very small type and capable of being driven by a low-powered engine. There is also a certain call for feed cutters, cake crushers, and similar machinery.

The only threshers that appear to have a sale in India are those of 32 inches and 42 inches, which require engines of about 9- and 11-brake horse-power respectively to drive them. One feature of the machines used in India is that they must have a drum attachment for bruising and cutting the straw to a length of about 2 inches, so that it can be fed to cattle. India has an enormous number of cattle, but is poorly off for grazing, especially in the dry months, consequently every atom of straw is utilized.

SPRAYERS

The demand for sprayers is apparently not large, but as spraying is strongly advocated by the agricultural departments for tea bushes, rubber and other trees, in order to destroy insect pests, it is very probable that their sale will increase. All sorts of spraying machines are used.

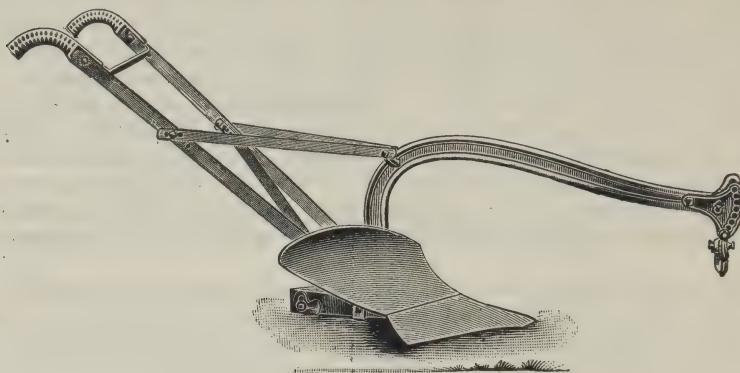
BINDER TWINE

As the use of harvesting machinery is extremely limited, and binders are rarely if ever used, there is no sale for binder twine.

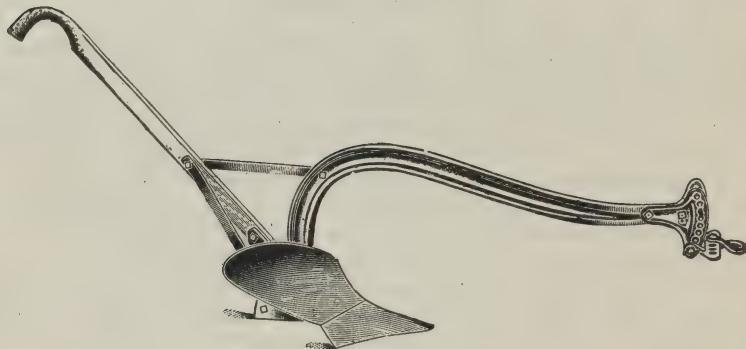
The Governor General in Council, on October 2, 1920, exempted from the payment of import duty leviable under Parts III and IV of Schedule II to the Indian Tariff Act, 1894, the following agricultural implements, when so constructed as to be worked by power other than manual or animal, viz: winnowers, threshers, mowing and reaping machines, elevators, seed crushers, chaff cutters, root cutters, ploughs, cultivators, scarifiers, harrows, clod crushers, seed-drills, hay tedders and rakes.

These implements when constructed to be worked by manual or animal power, were already free of duty.

Agricultural implements.—Two illustrations of ploughs used by ryots are included, one with a single wooden handle and the other with two steel handles. A third illus-



Showing Steel Handle Type



Showing one Wood Handle Type



A Native Indian Plough

tration shows the most simple native plough which is used in India, which is drawn by two bullocks. The length of the wooden shaft is 9 feet; the length of the wooden guide handle or upright is 4 feet. The net weight is 27 pounds. These ploughs are sold in India for from Rs. 7 to 8.

DAIRY MACHINERY

The statistics do not show the imports of dairy machinery, but if the information obtained from dealers is reliable—there is no reason to doubt it—the demand must be extremely small. The science of dairying has been very much neglected over the whole of India, but it would appear that attention is now being given to the subject, and the opinion of some who are in a position to know is that this industry will have a good future. A great deal, however, will require to be done before such a thing can be reached, principally in improving the strain of the country-bred cattle which are not suitable for dairy purposes and will require to be crossed with pure-bred stock. The question of feeding will also have to be taken up, as the methods which are in vogue at present are not such as will lead to the production either of large quantities of milk, or of milk containing a high proportion of butter fat.

There are very few dairy farms in the country, and those that have been established are more or less confined to a few Europeans, to the Military Farms Department of the Army, and to hospitals. The Military Farms, so far as can be learned, purchase their requirements of cream separators and other implements through the Stores Department of the India Office. Although the business is not large, it will probably be worth while for Canadian manufacturers to place themselves in touch with the India Office, as it is advisable that their goods become known in this market so that they may be ready for the demand which will probably spring up later on.

A few years ago some of the United States consuls and vice-consuls inquired into the trade in dairy implements, but judging from the reports, they appear to have found little to encourage them in the expectation of a wide demand. The Vice Consul-General at Calcutta reported that a few cream separators were kept in stock by two or three firms. The Consul at Madras reported that "the use of cream separators in this part of India is extremely limited, being restricted to only a few of the larger dairy establishments." The Vice-Consul at Rangoon stated that there were no large dairy farms in Burma, and no dealers who handled cream separators or other dairy implements. At Colombo the Consul reported that the market in Ceylon was extremely limited for cream separators owing to the fact that very little fresh butter is produced in the island for European consumption.

WINDMILLS

So far as could be ascertained, the demand for windmills is confined to the strip of coast in the Bombay Presidency. The reason for this is that in other parts of India there is not sufficient wind to drive the windmills in the season when they are most wanted—that is during the hot months. There appears to be quite a good sale in Bombay for wind pumps.

There is no doubt that in a country like India, where irrigation is of paramount importance, it would be a great advantage to the country if windmills could be used for that purpose, as they would provide a cheap method of lifting water. One factor which militates against their extended use is that they require careful attention if they are to be kept in efficient running order, and this is something which they are very unlikely to receive from the average agriculturist. Windmills which are being sold in the Peninsula are imported from the United States.

AGRICULTURAL SCHOOLS, ETC.

The Government of India and the various provincial governments, or some of them at least, are doing much useful work in spreading a scientific knowledge of agriculture amongst the people of India, but one official stated that unfortunately the agricultural departments are considerably understaffed. When one considers the enormous number of people in India who live by the soil, to say that the spread of a knowledge of modern methods amongst them will be of far-reaching consequences is to state a platitude; and yet a full recognition of this is not in evidence.

Much as has been stated is being done, but it shows what wonderful opportunities there are for still greater accomplishment, and when it is considered what an increased production of, say 20 per cent, would mean to the wealth of India, no effort would seem to be too great to bring about such a result. A 20 per cent increase in the production of India, even one of 10 per cent, would have tremendous consequences in the wealth which it would create, in the rise in the standard of living and in the enhanced demand for all kinds of articles. It is said that the yield per acre in India is less than that of any other country owing to the lack of manuring, and to the primitive methods which are practised. How to overcome these hindrances and to increase the productiveness of the land, is an economic problem which ranks second to none in India, and the solution of which it is to be hoped will receive the consideration and the support which it so eminently deserves.

CHAPTER XII

The Market for Machinery and Parts and Mill Stores

MACHINERY AND MILL STORES

A number of the kinds of machinery used in India, such as those for the sugar, tea, rubber, coconut, and jute and cotton industries, are presumably not extensively made in Canada, unless it be those employed in cotton mills. The total imports of machinery in fiscal year 1919-20 were valued at the huge total of over Rs. 9 crores, or roughly £9,000,000, taking the value of the rupee at 2s. (Of this amount about a crore and a quarter was for electrical machinery—generators, alternators, dynamos, motors, transformers, etc.). In addition, the Government imported on their own account machinery and mill work to a value of nearly Rs. 45 lacs.

Great Britain does over half the business in machinery, but the manufacturers of the United States have been successful in working up their trade, which has increased from Rs. 98 lacs in 1917-18 to Rs. 2 crores 80 lacs in 1919-20. In electrical machinery that country heads the list. In spite of the large purchases that are made in the United States, importers expressed themselves as dissatisfied. They complain that the packing is bad, being too light; that the Americans always want cash in advance; and that they do not know how to make out their documents. This last is a complaint very commonly heard, and it is one that Canadian exporters should carefully note.

PRIME MOVERS

It would probably be difficult for Canadian manufacturers of steam engines to establish themselves in the Indian market, as they would have to compete against manufacturers of the United Kingdom who have made for themselves a secure position which they are making strenuous efforts not only to hold but to improve upon. Some of them have opened offices in India, and consequently are very advantageously placed to take care of the trade. If Canadian manufacturers have had any idea of competing for this business, it would probably be better for them to relinquish it, unless they are at least prepared to send a representative over to study the market, and probably later on to open offices. As can be seen by the figures, the imports are large, amounting in 1919-20 to Rs. 71 lacs. These are considerably below the returns for 1913-14, which can hardly be considered as the high-water mark, for there is every reason to believe they will in the near future be far exceeded. The imports for 1918-19 were valued at Rs. 25 lacs, and those for the preceding fiscal year Rs. 28 lacs. Those for the months of April and May, 1920-21, were valued at Rs. 22 lacs, which is almost equal to the total for the whole of 1918-19.

Steam engines supplied in this market are of all sizes, from the large ones used in the textile mills to those of low power employed in the small factories in the latter of which there is a very good demand for 10- to 15-horsepower horizontal type.

BOILERS

Boilers are almost entirely of British origin. Up to recently they have been principally of the Lancashire type, although Cornish have found a certain amount of favour, but to nothing like the same extent. The Lancashire boiler is now meeting strong competition from the Babcock and Wilcox type of water-tube boiler, which is coming into increasing use.

The boiler trade would probably be a difficult one for Canadians to enter owing to the fact that most of the industrialists of this country are either English or Scots, who are thoroughly imbued with the idea that there are no boilers like those of the Old Country. Owing to the fact that native labour is employed in the furnace rooms, it is essential that boilers should be absolutely reliable, and this accounts for the preference shown by the importers for firms which they know in the United Kingdom. As far as could be ascertained, very few American boilers are used in India; and it is unlikely that any of the British industrial firms would purchase them if they could possibly secure an English make. What has been stated is not intended to discourage Canadian manufacturers who would like to establish themselves in the Indian market from making an attempt, and it can at least be said with confidence that they would have a better chance of success than their competitors from across the line.

MINING MACHINERY

The imports of mining machinery can hardly be considered large, only amounting to Rs. 15½ lacs for the year ended March 31, 1920, and for April and May, 1920, to a little over Rs. 1 lac. Probably the largest mining industry in India is coal. Next to that comes lead, which is principally mined in Burma. Whatever may have been the practice in the past, the present tendency in Indian mines is to install the latest machinery, as even with cheap labour this is found to be economical. An instance was given to the writer in which two electrical coal cutters had been installed in a mine, and it was said that they were such an improvement on the old methods that they were able to keep up a greater supply of coal than with the old transportation equipment could be hauled away.

PAPER-MAKING MACHINERY

In view of the fact that Canada has had a great and growing experience in paper and pulp making, and that the necessary machinery is now being manufactured in the Dominion for these processes, it is possible that a portion of the imports of India in paper-making machinery might be secured by Canadian firms.

Paper is made in India from imported pulp, and from native grasses, and at the present time large expectations have been founded on its prospective manufacture from bamboo. If this experiment proves to be the success which is anticipated, it would probably lead to a tremendous expansion in the manufacture of paper in that country. In view of this, it is highly advisable that Canadian manufacturers of paper-making machinery should keep in close touch with developments in the Indian market.

RICE AND FLOUR MILLING MACHINERY

Rice and flour milling machinery forms an entry in the import returns of India in which Canadian manufacturers should be interested—at least in the latter. Milling machinery is one the demand for which will probably grow to a considerable extent, the tendency being as far as possible to manufacture raw products in the country. Considering that India is one of the greatest wheat producers in the world,

it does seem extraordinary that the flour-milling industry has not attained to greater dimensions. Imports of this class of machinery in 1919-20 were valued at Rs. 12 lacs, as against Rs. 16 lacs in 1913-14. The imports for the first two months, April and May, of the fiscal year 1920-21, amounted to a little over Rs. 2 lacs. It may be thought that the machinery used in Canada would be too modern for India, on the assumption that it must necessarily be too complicated for Indian machinists. This is entirely erroneous.

SAW-MILLING AND WOOD-WORKING MACHINERY

There is a considerable business done in saw-milling machinery both for large and small plants. Considering the amount of this class of machinery which is produced in Canada, it should be possible to secure some of the orders which are going from India. In Rangoon it was stated that large timber firms preferred to do their own importing of machinery, consequently the most simple way to deal with them would be to get in touch with their London offices. One large firm in that port stated that they had a representative over in California studying the saw-milling methods in that State. An importer in Burma was of the opinion that it would pay Canadian manufacturers to open their own offices in India, but whether this advice was sound it is difficult at the moment to say. But certainly, in view of the immense forest resources not only of India including Burma, but also of Ceylon, Malaya, and the Netherlands East Indies, a Canadian firm would be fully justified in giving the closest attention to the suggestion. If it might not pay one firm, it might pay a group of manufacturers of saw-milling and wood-working machinery, saws, etc., to combine and open an office in India, to take care of the whole business in the Middle East. In any case it may be stated that the imports of this class of goods are considerable, and it is practically certain that they will continue to increase.

At the present time the machines in use are not nearly so up-to-date or so efficient as those employed in the big lumber mills in the Dominion. Installation at the moment of modern machinery might not pay on account of the inadaptability of the labour employed. It is more than likely, however, that it will gradually come into use.

It is extraordinary to observe the amount of timber which is cut in India by means of the old-fashioned saw-pit and the old-fashioned saw. But labour is cheap, and although the Indian does not work very fast, it must be remembered that he is only paid 6 or 7 annas a day for this class of work. A great amount of the saw-milling machinery is imported from the United Kingdom, and probably most of the saws in use in India were purchased in that country. Circular saws vary in size from 2 feet up to 7 feet.

According to importers there is a steady demand for wood-working machinery from new parts up to complete outfits. Inquiries, it is stated, are being constantly received for panel planers, thicknessing machines, planing machines, small band saws, planing knives, hand-power mortising machines, single and double spindle moulders, combination hand and foot power planing machines, and saw benches, etc.

OIL-DRILLING MACHINERY

As far as can be learned, oil-drilling machinery, which is mostly in use in Burma, originates in the United States. The reason given for this is that the majority of the drillers are American, and want the machinery to which they have been accustomed. The agents for one of the big oil companies in Rangoon stated that they had tried Canadian drilling rigs but did not find them as satisfactory as the American. This is probably, however, largely owing to the fact that the majority of the drillers are from the United States, and are naturally inclined to use American goods.

LAUNDRY MACHINERY

There are no steam laundries in India as far as is known, but they are badly needed. The system of washing clothes in India, is to give them out to a Dhobi, who

takes them down to the nearest stream or pond and there soaps them, and beats them with a piece of board or a flat stick, until he considers that they are clean. Another method is to beat the clothes against a large stone. It may be imagined the effect this has on the clothes. This washing of clothes in streams and tanks, as ponds and dams are called, is anything but sanitary, and it does not properly cleanse them. One or two inquiries have been made in regard to laundry machinery, and as it is probably only a question of time when modern steam laundries will be established in the cities of India, it is suggested that Canadian manufacturers put themselves in touch with likely importers.

OIL AND PETROL ENGINES

In some parts of India, particularly Bombay and Madras, there is a good demand for small crude oil and kerosene engines, particularly the latter, for irrigation purposes. The kerosene engine is most suitable to the country, as coal oil is obtainable in every town and village, whereas crude oil and petrol are difficult to purchase. If a wider use of small-powered irrigation plants were made, it would probably have an incalculable effect upon the prosperity of the country. In kerosene oil engines, the demand is for those which are suitable for a low-grade kerosene oil, as the Burma product is probably one-third lower than the United States standard, and for brake horse-power varying between 5 and 15. For crude oil engines inquiries are anything from 2 to 80 horse-power, depending on the requirements. One importer stated that he was interested in crude oil engines from 1 to 4 horse-power required for irrigation purposes, and another was on the look-out for one from 15 to 80 horse-power, which would be sold to rice mills, seed mills, and small factories.

While crude oil engines from 3 to 6 B.H.P. serve admirably for the cultivator, it is doubtful whether the idea would prove practicable. Elsewhere than in Burma, it is not always possible to buy crude oil, although kerosene is obtainable in any bazaar.

CONCRETE MIXERS

Concrete mixers have apparently been in very little use in India, but judging from conversations with many importers, interest seems to have been aroused, and it is likely that the market for these machines will show a considerable increase. Heretofore concrete has been mixed either by hand, or by cattle. Indian contractors are very conservative, and are loath to adopt anything new, but the efficiency and labour-saving power of the mixers is now being demonstrated, and it is likely that they will supersede the old methods. Where concrete mixers are in use, it was noted that the full economic benefit is not obtained. For instance, on a building near Calcutta, the concrete after being mixed, was carried away in small baskets by coolies, where a simple carrying device could easily have been installed. But that is characteristic of India all over. An enormous amount of building, however, must be undertaken in the near future, and as concrete is being largely used, it is certain to lead to an increased demand for mixing machines.

ROAD ROLLERS

As the Indian Government maintains a system of trunk roads, road rollers are necessary in their construction and maintenance, and they are also largely used in cities. British road rollers appear to be in general use. This is no doubt due to the fact that British manufactures are better known than any others in this market, and that they are purchased by Englishmen. Although Canadian products are not British in the ordinary acceptation of the word, nevertheless the mere fact that Canada is part of the British Empire will give Canadian machinery an advantage over that of any country outside, all things being equal. As the market is a considerable one and likely to grow, Canadian firms would be well advised to make every effort to secure a share of the trade not only in India but throughout the Middle East, where it may be said that a bad main road is the exception.

SEWING MACHINES

Although the statistics give no indication, there is not much doubt that the great majority of the sewing machines imported into India are made in the United States. This is largely owing to the wonderful enterprise shown by one of their most progressive companies. The imports for the fiscal year 1919-20 reached nearly Rs. 55 lacs, disclosing business of considerable importance, and for the first two months of 1920-21 they amounted to nearly Rs. 13½ lacs. An enormous number of sewing machines are in use in India.

COTTON AND JUTE MACHINERY

As it is not likely that Canadian manufacturers are yet in a position to be interested in cotton, jute, sugar, or tea estate machinery, which are mostly imported from the United Kingdom, very little time has been spent on its consideration. Owing to the war, American manufacturers were able to compete in this business, and in spite of the reputation of British machinery, it is not unlikely that they will be able to retain a substantial portion of the trade.

It has been reported that one of the larger firms of managing agents in Calcutta intends to manufacture all classes of machinery supplies for jute mills, but as far as can be ascertained they are not doing anything more at present than meet the requirements of their own industries. A company has been formed in affiliation with one of the largest manufacturers of industrial machinery in the United Kingdom, which will erect a large plant in Bengal, for the purpose apparently of not only making machinery parts, but machines themselves.

MACHINE TOOLS

As Canada is now producing an excellent class of machine tool, it should be possible for our manufacturers to compete in this market. Machine tools are being imported from the United Kingdom, the United States, and to a certain extent from France, and from Scandinavia. The machine tools imported are of the ordinary kinds such as lathes, high-speed drilling machines, wall-drilling machines, bench drills, etc. It is thought by some that India should be able to manufacture her own machine tools, and in support of this view, it is stated that certain kinds were made during the war in local engineering works. If the full facts were known however, it would probably be found that the attempt was not very successful from the point of view of economy, if indeed the quality was all that could be desired. It is one thing to manufacture an article when cost is not the determining factor, and another when it is. There is perhaps not at present a sufficient demand in India for machine tools to warrant the erection of a modern plant.

SPLIT PULLEYS

There is a considerable demand in India for split pulleys, practically all of which are made of iron, cast or wrought, and of steel. It is impossible to say what the imports are, but they must be of considerable value, owing to the large number of jute and cotton mills, engineering works, and the tea, rubber, sugar and other factories. Split pulleys are imported both from the United Kingdom and the United States. At present they are also made in India to a very limited extent, but it is hardly likely that the local product will in the near future enter into serious competition. While the old split wood pulley may be used, it is not considered suitable to the Indian climate, as it is inclined to warp.

CRUCIBLES

As far as could be ascertained crucibles are entirely imported from the United Kingdom, and particularly from one very well known firm.

CHAPTER XIII

The Market for Electrical Machinery and Instruments and Parts, and Automobiles and Supplies

ELECTRICAL MACHINERY

As may be seen from the statistics, the imports of electrical machinery are of considerable extent. Those for 1919-20 were valued at Rs. 1,24,06,808 and show the great expansion over the two previous years, which was to be expected. The United States had the greater share of the trade, and it is quite probable that the strong efforts which have been made by the manufacturers of that country to retain the market will be successful. The market for electrical machinery in the form of generators, alternators, dynamos, motors, transformers, etc., is likely to be a steady and even an expanding one. While hydro-electric installations work out very expensively in India, there is little doubt that they will be undertaken in the future, and that the immense quantity of power which is now going to waste in the vicinity of the Himalayan mountains will be utilized to an increasing degree. As it is, many tea estates in the Darjeeling district, where they are able to obtain sufficient power, have installed electrical machinery for the running of their factories, indeed it appears to be an established policy to replace steam power by electricity wherever it is feasible and economical.

There is a project on foot in Ceylon to develop part or the whole of the vast quantities of power which are running to waste at a water-fall some distance from Colombo; and it appeared in the summer of 1921 as if it were likely to come to fruition. But since then, owing to the extreme depression of the tea and rubber industries, it looks as if the scheme would be postponed until a more favourable period. It would, however, be well for Canadian manufacturers of equipment, if they are at all interested in electrical or hydro-electrical developments in the East, to get into touch with the projectors of this scheme.

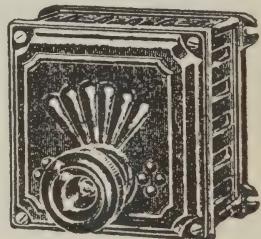
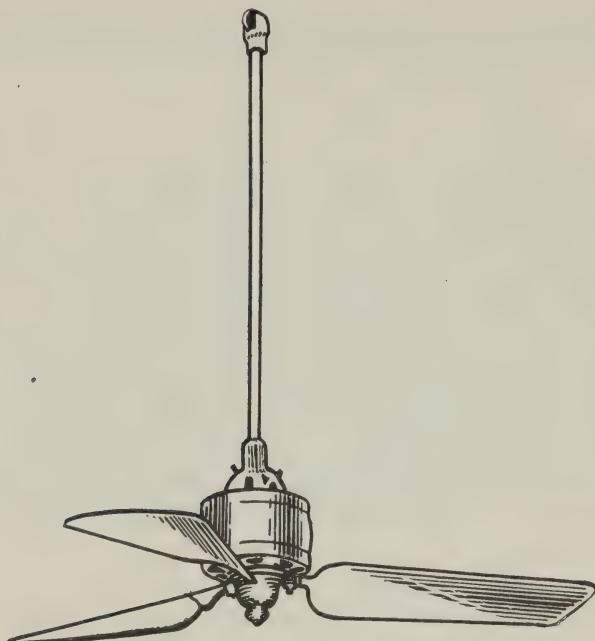
ELECTRICAL INSTRUMENTS, APPARATUS AND APPLIANCES AND PARTS

Like electrical machinery, the imports of electrical instruments, appliances, etc., are large and represented for the fiscal year ending 31st March, 1920, a value of Rs. 1,54,97,000. In this case the United Kingdom has the greater share, with the United States second. These two are much ahead of other competitors, the nearest of whom is Japan with Rs. 8,12,000.

There is a heavy demand in India for electrical fans both for the ceiling and for the desk. The competition in this line is strong, but the supplies from the United States and Italy seem to be favoured. One importing house stated that their sales amounted to about 2,000 ceiling fans a year and about 10,000 regulators. The following are illustrations of a ceiling fan and a regulator in popular demand in India.

The fan regulators which are used with the ceiling fans are fastened on the wall, usually beside the door of the room, and these as a rule give three speeds. These regulators are very useful, as it enables the speed of the fans to be slackened at night, and thus too much draught is not thrown on the sleeper, which it is particu-

larly necessary to avoid. Ceiling fans are for alternating current, but desk fans, which are usually 12 and 16 inches, are arranged for 230 volts direct current, and also for single phase 50-230 volts alternating current.



Electrical fan and regulator.

ELECTRICAL CABLE

The United Kingdom is very strong in the market for electrical cable. Any cable imported into India must be up to the Associated Cable Makers' standard of the United Kingdom.

Motor Cars, Motor Trucks, and Motor Cycles

MOTOR CARS

Motor cars are exceedingly popular in India, and have no doubt greatly influenced the mode of life of a portion of the population. They are rapidly displacing horse transport, and in this manner alone have added to the comfort, convenience and pleasure of their users, particularly in the country districts. Those who are in a position to judge consider that the motor car has a great future in India. The climate is intensely hot and uncomfortable in the summer months, especially during the period when the monsoon is at its height, at which time, in addition to the heat, there is a very high percentage of humidity in the atmosphere. No one walks in India during the heat of the day if he can avoid it. To do so only for a short distance soaks one through with perspiration. It can thus be readily understood how immensely the motor car has contributed to the comfort of their owners and users.

A great number journey to their offices in *gharries*, horse-drawn vehicles, but it is probable that with time a cheap motor car will displace this form of conveyance, always providing that petrol can be obtained in sufficient quantities, and at a reason-

able price. Motor cars are being increasingly used in the *mufussal* or country districts, particularly by tea, rubber, and other planters, and by those whose occupation compels them to live outside of the towns and cities.

Very large numbers of motor cars were sold in the fiscal year 1919-20, but signs were abundantly evident, at the time of the writer's visit, that the demand had considerably slackened, if indeed it has not almost ceased. According to information obtained from importers in Bombay, the trade in that city appears to have undergone a veritable slump, and the same applies to Colombo. In regard to conditions in Bombay early in 1921, the following clipping is taken from *The Statesman* of Calcutta, the news having been supplied by its correspondent in the former city.

"It would be interesting to know approximately how many motor cars there are now unsold in India; the number lying in the Bombay docks undelivered is continually increasing. There are now at least 900, and still there are more shiploads on the way, though there are threats of increased prices because of the altered exchange situation. It is not at all unlikely that further falls in prices will occur, at least now because of the American cars. There are rumours of a certain well-known make of car falling in price to below Rs. 2,000. With American cars and motor-cycles on their present prices, and with the possibility of a further reduction, the English motor industry has a very poor chance of a fruitful ground in India. The man who can get a moderately reliable American car for Rs. 2,000 or Rs. 3,000 or so is not likely in these days of financial stringency to pay the rupee equivalent of £500 or more for a British two-seater."

The demand in Calcutta seems to have held out longer than in other parts of India, but it has also ceased in that market; and as in Bombay, there were a large number lying in the docks, which were not cleared by importers, presumably owing to their inability to pay for them. India is suffering from the reaction which appears to be common to a greater part of the world—that is, from the frantic desire of a large number of people to possess articles which they are not in a position to afford. The present phase will pass, as at the bottom India is sound financially. Some of the importers will be hit hard, and may even go under, but in the end a demand will again spring up, and it can be confidently predicted that in the ordinary course the market will be a constantly expanding one.

Inquiries for a high-priced car are extremely limited. As stated in the extract from the *Statesman*, the public will not pay for an expensive English car, when they can obtain a much cheaper one from the United States which will meet all their requirements. Even when the price is no particular object, buyers are loath to purchase a high-grade car owing to the difficulty of obtaining expert chauffeurs.

A very important factor in the selling of motor-cars in India is the supply of spare parts. A tea planter in conversation mentioned that in his part of the country a number of people whom he knew had first gone in for high-priced cars, but had later changed them for cheaper ones, owing to the ease and rapidity with which spare parts could be obtained for these, as against the extreme difficulty in the case of the dearer cars.

The demand in Ceylon for the last year or two has also been very brisk, but as has been already stated, the trade in Colombo is now depressed like that of Bombay. Ceylon is passing through rather a bad time owing to the perilous condition of the tea and rubber industries, which has been brought about by the great fall in prices of both commodities. The island with its fine roads is admirably adapted for an extensive use of the motor car, and no doubt when the tea and rubber industries improve, demand will once more reassert itself.

Motor cars for India and Ceylon should have a ground clearance of about 8 inches and a right-hand drive. These are probably the principal points to be kept in mind, although with such chauffeurs as there are, the simpler the mechanism, and the more fool-proof a car is, the better. In Ceylon a high-powered car is not required, but what is wanted there are good hill-climbing properties. The roads

almost on leaving Colombo commence to ascend, and as these are narrow, winding and twisting about the hills, there is no opportunity to work up anything beyond a moderate speed. One point that is of considerable importance in connection with motor cars is that of colour. So far as can be ascertained, black is not cared for as being too sombre, and stress was laid upon this point particularly in Ceylon. Grey, dark green, dark blue, etc., are very much preferred to black, and khaki-coloured hoods to black hoods. It should also be stated that, as labour is cheap in India and Ceylon, there is no necessity to paint over the brass work, which is admired, particularly by native purchasers. The Indians and Sinhalese prefer a car of pleasing colour and one that is rather showy, as they feel that the possession of such a vehicle adds to their standing in the community.

A fair number of taxi-cabs are in use in the large cities in India, although nothing approaching in number to what one sees in the United Kingdom, the United States or Canada. *Gharries*, which are usually drawn by broken-down horses, and are extremely slow in motion, are gradually being displaced by the motor-car. There is no particular type of taxi, and probably more often than not, it is a second-hand car which has been purchased for the purpose. As a matter of fact, it would be very much better if the handier type of taxi which is used in Europe and America were employed, as many of those which have been pressed into the service are too unwieldy.

For the year ending March 31, 1920, 9,925 motor-cars were imported into India, of which 9,353 came from the United States and 448 from the United Kingdom. According to the Department of Statistics, 5,292 motor-cars were imported during the four months ending July, 1920, of which 4,015 came from the United States, 616 from the United Kingdom, 510 from Canada, 35 from Italy, and 19 from France. It is stated, however, by that department that many of the cars shipped from the United States originated in Canada, and this is more than likely, as the only car imported from the Dominion is extremely popular in India, and meets with an excellent sale. Of the five thousand cars imported in the first four months of 1920, 1,983 were consigned to Bombay, 1,860 to Bengal, 710 to Madras, 396 to Burma, and 373 to Karachi. For the month of August, 1920, the cars imported numbered 1,165, of which 916 came from the United States, 139 from the United Kingdom, and 32 from Canada.

MOTOR-TRUCKS

At the present time the number of motor-trucks in India is not large, but very probably is rapidly growing. Transport in that country is principally done by the ox or buffalo cart, which is exceedingly cheap, and as far as price is concerned, can usually compete with the motor lorry. According to one or two dealers who have made a study of the question, the ox cart costs about 3 annas per ton-mile, but that is without making any allowance for the heavy mortality to which the animals are subjected; whereas a one-ton lorry costs in the neighbourhood of 10 annas per ton-mile, and a 5-ton lorry about $3\frac{1}{2}$ annas per ton-mile. Against the higher cost of running a motor lorry, must be set its greater convenience and the fact that whatever work has to be done by it is accomplished in a fraction of the time consumed by an ox or buffalo cart. For compassionate reasons if for no other, it is sincerely to be hoped that the motor lorry will rapidly displace the buffalo cart, as it is a pitiful sight in the streets of Calcutta to see the wretched animals in the hot weather dragging heavy loads. In India the buffalo is a water animal, and if allowed to do so, would spend a considerable part of the day in a pond submerged up to the nose.

Motor lorries are being increasingly used by the jute mills in Calcutta and the cotton mills in Bombay, and they are very suitable for such employment. In the latter the trucks said to be most suitable are those for $3\frac{1}{2}$ and 5 tons capacity. In Bombay the great difficulty heretofore met with, and which is still present, is in obtaining adequate supplies of petrol. One firm which are starting a transport busi-

ness stated that, owing to this difficulty, they had made up their minds to use steam tractors instead of motor lorries. There is considerable demand in the country districts for motor lorries of from 1 to 2-ton capacity for use as busses in transporting passengers between railway stations and their villages in the country, particularly in the thickly settled parts in the Punjab and in other sections. These light lorries are also being used in the *mofussal* in increasing quantities, for transporting goods. And in Ceylon they are now being extensively used by tea planters. The sale in that island of 2-ton motor lorries is likely to expand, although of course not until a general business revival takes place.

The imports of motor wagons for the fiscal year ending March 31, 1919-20, are given as 1,229 against 8 in the previous year and 15 in 1918-19. For the first two months of the fiscal year 1919-20, the imports of motor wagons are given as 224.

MOTOR CYCLES

In India there has been a good demand for motor-cycles, the trade in which is fairly well divided between British and American makes. For the fiscal year ending March 31, 1920, 2,332 motor-cycles were imported, of which 1,259 originated in the United Kingdom, and 1,014 in the United States. For the first two months, April and May, of fiscal year 1920-21, the motor-cycles imported totalled 737, of which 420 were supplied from the United Kingdom and 300 by the United States.

CYCLES

There is a very good business done in India in bicycles and accessories. The imports of bicycles for the year ending March 31, 1920, amounted to a value of over Rs. 19 lacs, and the accessories to another Rs. 13 lacs, or a total of over Rs. 32 lacs. In 1913-14 the imports only amounted to Rs. 1,27,00,000. For the two months ending May 31 of fiscal year 1920-21 the supplies of cycles and spare parts brought in were valued at something over Rs. 13 lacs, or nearly half the total imports in 1919-20. What was said in regard to the use of motor cars applies equally to cycles: that owing to the extreme heat, what is wanted is an easy mode of locomotion, and the bicycle affords much more expeditious means of getting about than walking. It also saves an immense amount of exertion, which is of great importance in the Indian climate.

The business in bicycles is likely to be steady and continuous, and as they are neither made nor even assembled in the country, all requirements will have to be met abroad. While the American motor cycle is popular in the Middle East, the bicycle of that country does not seem to have taken with the public, so that the imports come almost entirely from the United Kingdom. The Birmingham bicycle is well known in India, and is believed to be reliable, and, as has been already stated, the Indian public, being very conservative and going largely on marks, prefers to purchase some make that they know. However, there is no reason why a Canadian bicycle, providing it can compete in price, should not make at least a very good attempt to establish itself on the market, and probably with aggressive methods it could be made to succeed.

As the demand for cycles is good, so also is that for tires and accessories. These, like bicycles, are purchased almost entirely in the United Kingdom.

MOTOR TIRES

The imports of tires for motor cars, motor lorries and motor cycles amounted in the year ended March 31, 1920, to 126,811, which shows an increase over the two previous years of about 24,000. Of this the United Kingdom supplied 47,000, the United States 40,000, France 19,000, and Italy 14,000. For the first two months

(April and May) of fiscal year 1920-21 the imports were 40,632, of which the United Kingdom supplied 11,000, Italy 17,000, the United States 5,000, and France between 5,000 and 6,000. It is interesting to note the advance made by Italy in this trade, which for the two months just referred to were 3,000 more than for the whole of the previous fiscal year.

The competition in motor tires appears to be exceedingly keen, and importers are not at all desirous of taking up new marks—a condition that will continue while the present depression in the motor trade lasts. No doubt, however, a Canadian tire that can compete with those from other countries could, if it were aggressively and perseveringly pushed, eventually secure a share of the trade. But it would be folly to minimize the difficulties of the market particularly at the present time; for owing to the slackening in demand for motor cars, the trade in tires has naturally declined in sympathy. The only Canadian tires which are known in the Indian market are those which have come over on Canadian cars.

MOTOR LAUNCHES

The demand for motor launches is not extensive, but so far as can be learned is fairly steady. The average size is for boats of about 20 to 30 feet suitable for use on rivers such as the Ganges, the Brahmaputra, etc. Very few launches are imported complete, the engines being usually imported and the hulls built locally.

In other parts of the world where a good deal of carrying is done by river craft, comparatively small-power engines have been installed to replace or supplement man-power, but little of this has taken place in India, and it is not likely to do so, while labour remains so cheap. Very few of the owners of river craft could possibly afford to install a motor engine, even if it would pay them to replace them with man power. However, as there is a certain demand for launch engines, and one that may increase, it would be advisable for Canadian manufacturers to place themselves in touch with importers on this side.

CHAPTER XIV

The Market for Hardware and Paints

Hardware

The imports of hardware into India are of considerable importance, and in this variety of goods Canada should be able to compete. Hardware importations for the fiscal year ended March 31, 1920, amounted to over Rs. 4 crores, which at par rate of exchange is in excess of £4,000,000. Further the Indian Government also imported on its own account hardware (including agricultural implements and machinery and plated ware) to a value of over Rs. 87 lacs. The trade for this period reveals a considerable increase over the two previous years, while it is almost double that of 1917-18. The total imports for the first two months (April and May) of fiscal year 1920-21 amounted to Rs. 88 lacs.

GALVANIZED BUCKETS

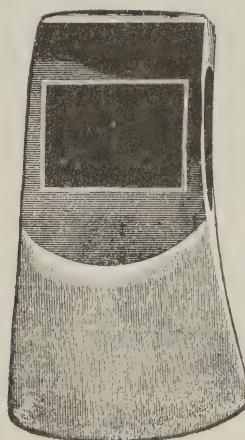
Canada has at various times exported galvanized iron buckets to this market, and although the trade is not of considerable importance, it is well worth cultivating. Galvanized iron buckets, it should be stated, are now made in India, and it is no doubt owing to this that a decrease in their importation for 1919-20 is to be remarked as compared with previous years.

BUILDERS' HARDWARE

The Dominion should certainly be able to secure a substantial share of the imports of builders' and domestic hardware, enamelware and hand tools. According to importers, samples of Canadian goods shown in India have met with their approval. It is more than likely indeed that in the course of the next year or two Canadian sales in this regard will attain to a substantial figure.

There is a demand for all types of hand tools. Axes produced in Canada are very suitable not only for this market but for the whole of the Middle East, as well as other hand tools such as hammers, chisels, saws, etc.

An illustration of an axe used in India is appended.



ENAMELWARE

Enamelled ironware from Canada is to be found in various shops in India, and it is satisfactory to note that the same bears a high reputation. Only two complaints were heard by the writer in regard to it; namely, that importers were unable to secure as large quantities of it as they desired, and that one shipment of nested buckets was so closely jammed together that it was found practically impossible to separate them without chipping the enamel.

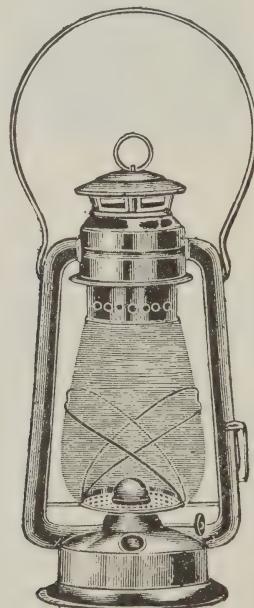
Enamelware in the form of coagulating dishes, latex cups and buckets is very largely used on rubber estates. It is essential that these articles should be of the best quality, as, if the enamel becomes chafed or worn, the underlying metal is eroded by the acetic acid, which is mixed with the latex for coagulation purposes.

The wide use of enamelware can be observed by the imports, which amounted in fiscal year 1919-20 to practically Rs. 6 lacs, and is still more strikingly evidenced by those for April and May, 1920, when they amounted to over Rs. 9½ lacs. Enamelware is now extensively employed as a cheap substitute for brass vessels, which heretofore have been almost universally used throughout India. A certain amount of enamelware is made in the country, and it may in time compete with the cheap Japanese article; but it is unlikely to have much influence upon the imports of that class of goods to which the Canadian product belongs. It is natural that the general demand should be for a cheap quality of enamelware, in view of the extreme poverty of the people. That for high-class and domestic enamelware is practically confined to Europeans, Anglo-Indians, and the better-class Indians. Those utensils most in demand for domestic purposes are cups, saucers, rice dishes, plates, pots, kettles, etc.

LAMPS

The entry under metal lamps is a substantial one, amounting in 1919-20 to over Rs. 34 crores, while parts without glass total Rs. 6 lacs. The imports of metal lamps for 1913-14 were valued at about £275,000, the largest suppliers being the United Kingdom, Germany, Austria-Hungary, and the United States, the latter supplying the better class. The United States are by far the largest exporters of lamps to India, their trade in 1917-18 amounting to no less than £28,000.

A cheap grade of lamp is made locally, which no doubt in course of time will exert considerable influence on the imports of the same class of article now supplied from Japan. It is probable that a considerable part of the imports from the United States was made up of lanterns of a very well-known make. It is only necessary to walk through any bazaar in order to appreciate the enormous market there is for the ordinary class of hurricane lantern. It is rarely that one passes a shop that deals in hardware without seeing two or three lanterns hanging in the doorway. The agents of the American firm referred to advertise that they sell 1,000,000 lanterns a year in India, and no doubt this statement is true. There is no reason why Canada should not be able to market a lantern in India and the Middle East equal to any produced in the United States. But as this market goes very strongly on brands, it might at first have an uphill fight. Yet there is no question that if the Canadian product were equal in quality to the American, and say slightly cheaper in price a considerable trade could be done. An illustration of a lantern in general use is shown below.



Before the war the Germans did business with a brass-coloured lantern, which was said to resemble very closely the appearance of brass itself. The lanterns seen in the bazaar are for the most part tinned.

DOMESTIC HARDWARE

It is difficult to appreciate what exactly is included under the item domestic hardware, but presumably it refers to kitchenware and other articles such as stoves, refrigerators, etc.

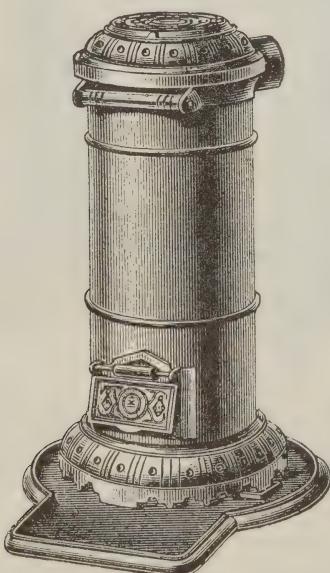
Stoves

The demand for stoves is comparatively small, and is confined generally to Europeans. The ordinary type of stove is one which will burn coal or coal and wood. One dealer in Bombay stated that the sale of stoves in the past had been small, but that now they were being installed in most of the bungalows under construction. Practically the whole of this trade is done with the United Kingdom, or, more exactly, with Scotland.

There is a small-to-fair demand for oil stoves of the one, two, three and four-burner types, with ovens attached to the larger ones. One of the factors that is stated to militate against a more extensive sale of stoves, both of oil and ordinary, is that a large percentage are broken in transit. If this could be overcome by improved methods of packing, thereby reducing the cost, the sale would increase. Kerosene stoves should be popular, as the oil is easily obtainable in every town and village throughout India and at a comparatively reasonable price. Primus stoves are used to a considerable extent, both the one and two-burner types, while there is also a small sale for ordinary cheap one-burner oil stoves. Both the Primus and the one-burner stove are stocked in most hardware stalls in the bazaars.

Ordinary cooking stoves usually come out in wooden casing, with the loose parts packed in the oven.

The wealthier native uses a stove called a *choola*, made of bricks, and primitive in design. This stove is also found in apartment houses, for fortunate is the tenant with a proper stove. The poorer classes of natives employ a kind of stove known as the *angati*, that is nothing more than a brazier. Even the better class of Indian does not use an oven, and this remark of course applies to those Europeans who use the *choola* instead of the imported cooking stove. Since Canada manufactures stoves

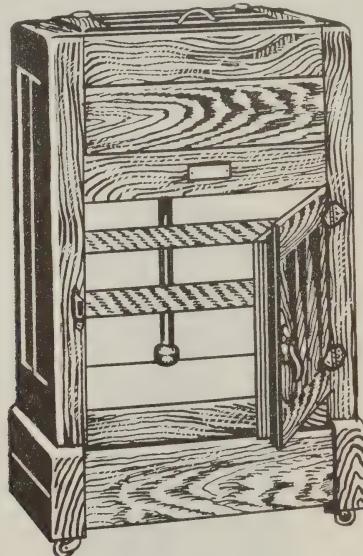


in very large quantities, it should be possible under present conditions to compete effectively against any other part of the world. If the problem of breakages was taken up energetically with shipping companies plying between India and Canada, the ratio might be reduced. Very careful packing and careful handling would do much to effect an improvement over existing conditions in this regard.

There is a certain demand for what is known as monsoon drying stoves. These are used for drying rooms and clothing during the monsoon period. They are also locally known as internal combustion stoves, and are of the type illustrated on preceding page.

Refrigerators

There is a considerable market in the Middle East for refrigerators. Since they are not shown separately in the statistics, it is impossible to say exactly what amounts are imported into India; but, as an example of their widespread use, one firm in Calcutta stated that their turnover in the course of the year probably reached Rs. 20,000 to Rs. 30,000. Since it is exceedingly hot during summer and is only comparatively cool in winter, it will be readily understood that for a well-appointed house refrigerators are an absolute necessity. The United States easily control this trade; in fact no refrigerators of any other country have been met with by the writer in any part of India. But since one very popular line comes from as far as Chattanooga, Tennessee, there is no reason why Canadian manufacturers should not secure a considerable share of this business. Those imported are of all sizes and with or without provision chambers. An illustration of one in popular demand is appended.



Small ice chests are also sold in India, being used by persons of limited means, and to a certain extent by travellers in trains.

A small demand exists for ice cream freezers, but this is almost entirely confined to one American make.

Aluminium Domestic Ware

Aluminium ware is much used. This is both made in the country and is also imported in considerable quantities from the United Kingdom. Although the latter is more expensive, the better-class people seem quite willing to pay the difference in price, as the British-made article is thought to be, and probably is, superior to the domestic. Aluminium, like enamelware, is employed to replace the brass and bronze vessels commonly used by the people.

Wooden and Kitchen Ware, etc.

The demand for wooden rolling pins, bread boards, wooden washing machines, wooden spoons, clothes pegs, etc., is quite unimportant, and whatever it may amount to, is entirely confined to Europeans, who form numerically a fractional part of the population. Whatever imports there are in this connection probably originate almost entirely in the United States. Washing machines are never used, and would be something of a curiosity to the *dhobi*, as the Indian laundry boy is called. His method, as has been already described, is to wash the clothes in a stream or pond.

There is a small demand for miscellaneous articles such as carpet sweepers, floor polishes, and all of the odds and ends that are usually found in a well-appointed house in Canada. The sale for them is necessarily very limited.

Padlocks

So far as one can judge, there is a good demand for padlocks. These are very much in evidence in those bazaars where hardware is sold. The greater portion of them are of very cheap quality and of local manufacture. But the imported article seems also to be in considerable request, for every shop shows one very well-known American make that is also produced in Canada.

Tinned Clothing Boxes and Cases

The visitor in India cannot fail to observe the number of people who travel with tin boxes and cases of all sorts and sizes and shapes. This is owing to the extreme humidity of the atmosphere, in the monsoon period, and also to the necessity of protecting valuable clothing from insect attacks.

SHELF HARDWARE

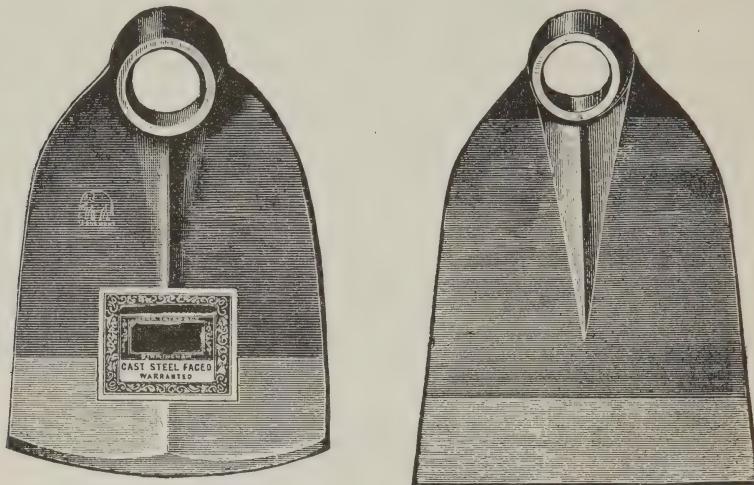
In discussing shelf hardware, importers remarked that they liked American goods, on account of their convenient packing. For instance, hinges, pliers, etc., come out in separate boxes, and a number of the small boxes are contained in a larger one. Likewise, lock handles, scutcheon plates, screws and safety hasps all come out in boxes instead of being packed separately as is the British practice. One dealer in Ceylon spoke in most unflattering terms of the English packing of shelf hardware as compared with that of the American.

SHOVELS

The shovels used in India and Ceylon, and generally in the Orient, are of a cheap-to-medium variety. The price limit given by one importer in India was 26s. 6d. a dozen, less 3 per cent discount, f.o.b. United Kingdom. Black or natural-finished plates are generally employed with round and square ends and E handles. The square ends are the more popular. Railways and mines probably use most of the shovels, and tea estates account for a fair number of spades. There is a certain demand for pick axes.

KODALIS

While the demand for shovels, spades and picks is not large, and as already stated is probably limited to the railways and mines and tea estates, there is a very large business in what are called *kodalis*, or in southern India *ma mooties*, and in

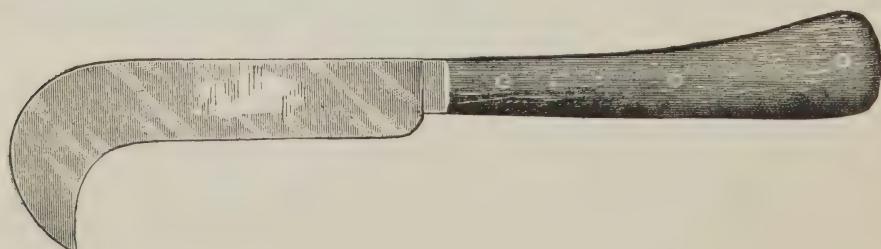


Malaya and Java *changkols*. This is the tool almost universally employed by the peasant throughout the Middle East. It is something of the shape of a hoe, but as it would be difficult to describe, and is probably quite unknown in Canada, an illustration of two different shapes is given above.

Practically the whole of these tools originate in the United Kingdom. One of the large importers stated that an English manufacturer had made a personal visit to this market to study the demand for such tools as shovels, spades, and kodalis, and with the information which he had gained, and the connections which he had established, had been able to create a very substantial business. Unfortunately figures are not available for the imports of kodalis, etc., but it is admitted that the supplies brought into Calcutta alone amount to from 50,000 to 60,000 dozen per annum.

One importer stated that he had had some pitchforks and kodalis from Canada, but spoke of them in uncomplimentary terms and sarcastically referred to the way in which they had been decorated with gold paints, as if to cover up their defects. At the same time he believed that Canada could turn out a good and satisfactory article, and expressed himself as willing to place an order for 1,000 dozen with any Canadian manufacturer able to compete with Wolverhampton in price.

Kodalis run from $3\frac{1}{2}$ to 4 pounds in weight, and pickaxes to about $6\frac{1}{2}$ pounds. There is also what is known as a beater pick, of which one end is pointed and the other made like a hammer head. This weighs up to 10 pounds. A good trade is done



in 4- and 5-prong kodali forks. There is a considerable demand for other classes of tools, such as pruning knives used on tea estates and pickers used in jute mills. An illustration of the kind of knives used on tea estates is given on opposite page.

SLEDGE HAMMERS

Sledge hammers of from 3 to 23 pounds weight, which as a rule are purchased by the ton, are in good demand, as are stone-breaking hammers weighing from 1 to 4 pounds and miners' hammers of 6, 7, and 8 pounds weight.

CHAIN PIPE WRENCHES

There is said to be a good sale for chain pipe wrenches, and this is understandable in view of the large amount of piping used in the country.

HANDLES

The Middle East presents a very good market for the handles of such tools as rakes, scythes, picks, hammers, axes, and snathes, all of which, or nearly all, are purchased in the United States. Handles made of hickory are required, it being expressly stated that ash handles are not wanted. India does not appear to produce a wood suitable for the manufacture of handles.

CHAINS

There is a certain demand for heavy and a good demand for lighter chains, and for dog chains. The last have swivel spring hook and are required in 5, 6, 7, 8, 9, 10, 11 and 12-gauge of 4½ feet to 6 feet long. It was stated that chains must be accompanied by a certificate of breaking strength, furnished by the makers. A buyer stated in conversation that he was hopeful of inducing the Port Trust of the city in which he lived to purchase their requirements in chains from him, and he expressed the intention of obtaining them from one of the largest chain makers in the United States. That country appears to have a very good hold on this business throughout India.

SCALES

The sale of scales is one of considerable magnitude in India. A Canadian make is frequently seen. This is a business that might very well be worked up by Canadian manufacturers.

SAFES

Safes are largely used throughout India, and are imported both from the United States and from the United Kingdom. The latter are preferred, owing to their better reputation; the former being considered somewhat light.

Before concluding this section on hardware it might be well to point out to Canadian manufacturers that the important position which the United States has attained to in this trade has been largely won within the last two or three years. Hardware is a class of goods in which Canada is well adapted to compete, and there is not the slightest doubt that with the direct steamship service which has been inaugurated by the Canadian Government, Canadian manufacturers should easily be able to obtain an important share of the trade.

A number of various lines of hardware are now being made in India, such as pruning knives, jute pickers, hinges, locks—to name only a few. But whether they will be able to sustain foreign competition remains to be seen. Some of these articles are made by hand, and it does not seem likely that those which are turned out in this way will be able to compete against mass production. The Indian

Munitions Board Handbook remarks on this aspect, "Until the use of machinery becomes far more common in India than at present, it is doubtful whether, in spite of the great and increasing demand for all articles of hardware in India, local manufacturers will be successful." This report however appears to take a more or less optimistic view, presumably of a future time when machinery will be more extensively used, and the necessary supply of skilled labour available. For the present this view can be discounted, and Canadian manufacturers of hardware may feel reasonably assured of a valuable market in India for an indefinite period, providing they will make the class of goods that are required and will rigidly conform to the instructions of the importers.

Paints

Paint and colour imports into India are considerable, amounting in 1919-20 to 272,000 cwt., an increase over the two previous years. The United Kingdom has the bulk of the business, her share in the year mentioned totalling 225,353 cwt., against imports from Japan of 21,265 cwt., and from the United States of 14,391 cwt.

Paints are made in India, and in the opinion of some dealers the domestic article is quite able to hold its own against the imported. Canadian paints have been bought, but the opinion expressed regarding them was, that they were about 20 per cent too dear. The market is a peculiar one, and it is necessary that manufacturers study it carefully, in order to find out exactly what is required. As far as can be judged, the demand is mostly for a cheap paint, although this was more noticeable in some parts than in others. In Karachi the demand was for a very cheap quality, little better than rubbish. On the east coast, on the other hand, the demand appears to be entirely limited to one particular make of British paint, and it was said that for any other to establish itself in the market would require a good deal of enterprise, while it would have to be sold at cheaper price. In Calcutta and Rangoon, a paint made in the United States seems to be competing strongly, and its agents are apparently doing satisfactory business. This it was stated was not only due to the excellence of the product itself, but also to the aggressive but at the same time clean methods of the owning company.

The Indian paint industry is well off for raw materials such as linseed oil, raw, refined and boiled, and for turpentine, although the boiled oil is said not to be equal to the raw. Turpentine produced in the country is of good quality, and adapted to paint and varnish making. India manufactures red lead of very good grade. For some reason no attempt has been made to manufacture white lead, although the metal is available in Burma in large quantities. No figures are obtainable as to the quantities of paint manufactured in India, but judging from what could be learned from importers, they are not great, and in spite of abundance of raw materials, it is probable that the lack of skilled labour will make it difficult for the domestic article to put up strong competition, certainly during the next few years. The same remark applies to varnish, as although there is an ample supply of suitable raw materials, the mixing of its various ingredients requires so much care, and particularly in the addition of the thinners, that it is hardly likely that this industry can greatly expand.

The imports of varnish into India in the fiscal year 1919-20 amounted to 27,000 cwt. The total value of all classes of paints and painters' materials imported in that year amounted to Rs. 13,00,000, which was about the same as for 1918-19.

CHAPTER XV

The Market for Leather, Boots and Shoes, and Wearing Apparel

Leather

The imports of leather into India were valued at Rs. 18 lacs in the fiscal year ending March 31, 1920. Foreign-made leather is confined almost entirely to the better qualities. This is natural, as India produces large quantities herself, of a quality suitable to the demands of the population outside of the European and the wealthier class of Indians. The English and American leathers are undoubtedly better than the local product. The difference in price on custom-made boots in the manufacture of which imported leather is used as compared with the domestic, shows that this is fully recognized. One importer in comparing United Kingdom and United States leather with that of India, said that the last does not compare in grain or in finish with the other two, nor is it prepared so economically. While the importations of leathers are not very considerable, they are large enough to warrant Canadian tanners in making an attempt to establish business relations.

Patent leathers apparently come in almost entirely from the United States. One importer stated that he had received quotations for a German product through a French firm in Paris, and he further mentioned that the quotation of \$1.35 cents a pound was given in United States currency.

In addition to the demand for leather itself, there is a market for manufactured leather articles such as trunks, suit cases, etc. The imports of these in fiscal year 1919-20 were valued at over Rs. 3½ lacs. Leather pickers were purchased abroad to the value of Rs. 5½ lacs, picking bonds and strips to over Rs. 4 lacs, and roller skins to Rs. 5½ lacs—all of which are used in the jute mills. Saddlery and harness were imported from the United Kingdom in the same year to the value of over Rs. 2½ lacs. As far as harness and saddlery are concerned, it would probably be useless to attempt to compete in this market, unless manufacturers were prepared to make exact imitations of the English articles. An article made on a pattern to which the public are unaccustomed would meet with no success.

Boots and Shoes

The manufacture of boots and shoes in India has attained considerable importance, and local producers are able to fairly well take care of the demands made by the ordinary classes of the population. As India is an enormous producer of hides and skins, it is advantageous as well as natural, that boots and shoes should be made within the country, and this industry may be considered as one admirably adapted to it.

LEATHER IMPORTS

In spite of the competition put up by local manufacturers, boots and shoes or leather were imported in fiscal year 1919-20, to the value of nearly Rs. 32 lacs. Boots and shoes were freely supplied from the United States during the war, when they were not obtainable from the United Kingdom, but it would appear from the statements of dealers, that with the freeing of British industries, they have returned very largely to their old source of supply. At the same time there are several well-known United States makes on the market, and these are probably in considerable demand. It was noted that two well-known makes of American boots are advertised in the local papers. This at least shows an aggressive spirit, which will probably meet with success.

DEMAND, SIZES, AND PRICES

The strongest objection levelled against American shoes by importers is, that they are becoming too expensive, what with high prices and the adverse rate of exchange. The market for imported shoes is entirely confined to Europeans, Anglo-Indians, and the better classes of Indians. The demand is all for ordinary kinds—that is black, brown, and patent; but for shoes rather than boots, and in narrow rather than broad toes. The average sizes run from 6 to 9 for men, in broad last. One dealer showed some samples which he had obtained from Canada. He stated that they were from 20 to 30 per cent too high in price, and that he could not possibly sell them. The principal demand is for a shoe that would cost from Rs. 8 to Rs. 10 c.i.f. It is probably useless to give prices, as exchange is fluctuating so violently that, unless they are given in sterling or gold dollars, they are practically without value for purposes of comparison. Side spring shoes, made of glazed kid, buck, willowcalf, are in considerable demand, but as these are largely worn by natives, it is more than likely that their requirements are met by domestic manufacturers.

The boot and shoe trade in India is divided into two classes—one for Europeans and the other for the bazaar. A dealer who caters to the best class of trade mentioned that boots for men mostly in demand with him run from £1, 2s. f.o.b. United Kingdom, but he added that he was more interested in securing from Canada a high-class lady's shoe in leather and satin, which might run from 35s. to 40s. a pair.

The manufacture of boots and shoes in India appears to be conducted in connection with some of the large tanneries, and it is said that there is a good deal of boot and shoe machinery on order, but it is doubtful if this had arrived at the time of the writer's visit. India is suffering from labour troubles like the rest of the world, and it is highly probable that this may have a strong influence upon the local manufacture of boots and shoes, particularly as it concerns the possibility of keeping out the foreign-made article.

With regard to the use of boots and shoes amongst Indians, in walking along in the towns and cities one notices that while a great many of the people do not wear socks, most of them wear some form of shoe. In all likelihood, therefore, the tendency will be for the demand in boots and shoes to increase steadily, and as the use becomes more general the demand for a better-class article will move with it. Rubber shoes for athletic purposes are in considerable request in India, and in Burma there is a market for these with stout canvas uppers, not merely for athletic purposes, but also as ordinary footwear by the natives. These articles are almost entirely shipped from Edinburgh. They have made for themselves an excellent reputation, as it is conceded that they are of uniformly good quality and exceedingly well packed.

From inquiries made, it would seem that several of the importers are ready to consider quotations from Canadian manufacturers, particularly if these are accompanied by samples. There is also a large demand in India and Ceylon for white shoes, especially for women.

BRUSHES

Trade in brushes of various kinds is of some little importance, but at the same time these goods are now being made locally, and dealers are of the opinion that the domestic article will be able to withstand foreign competition, or at the worst, keep the trade down to its present proportions. The total imports of brushware for fiscal year 1919-20 were valued at about Rs. 9½ lacs.

Brushes were manufactured in India before the war, but were largely confined to horse and mule body brushes and brushes for cleaning military equipment, clothes, etc., and also a certain quantity of hair brushes. As India is well off for bristles, her manufacturers should be able to withstand foreign competition in the future; certainly this should be the case if the factories are properly organized.

Carpet brooms are practically never seen in the country, as the sweeping, which is all done by Indian servants, is performed with the locally made article. This is very often not much more than a bundle of twigs tied together. A few Europeans may use the ordinary broom, the demand for which must be infinitesimal.

Wearing Apparel

HOSIERY

Cotton textiles, so far as imports are concerned, are presumably not of much interest to Canadian exporters, in consequence of which little time has been expended by the writer on them. Inquiries have been confined to those particular articles which it has been thought may be of absolute necessity to Canadian manufacturers in search of a market. Going down the list of textiles, the first that is likely to attract attention is hosiery. A reference to the trade statistics will show that the total imports for 1919-20 were valued at about Rs. 1½ crores, or roughly £1,500,000. (These figures also probably include underwear.) They show a very considerable advance on the two previous years. The imports for the first two months of 1920-21 (April and May) were valued at about Rs. 28 lacs, and underwear, which in that year was separated from hosiery, at something over Rs. 4 lacs. As may be gathered from the statistics, Japan in 1919-20 had about 90 per cent of the business, and for the first two months of fiscal year 1920-21 appeared to be holding her own. This in spite of the fact that, owing to the methods practised by the Japanese in the later years of the war, the goods of that country are not popular. But as has been stated, for the bazaar trade cheapness is everything, and the Indian with little money to spend does not stop to consider whether it will pay him in the long run to buy a better class of hosiery at a high price; it is simply a question most times of being able to buy something cheap or nothing at all. Cotton hosiery is now being imported from Hong Kong, where it is manufactured, and according to one dealer these goods are quite equal to the Japanese; and they are cheap.

Undoubtedly the demand for hosiery is on the increase, as even the poorer class like to wear them on special occasions. In the towns and cities this is very noticeable. It is almost certain, as the wealth of the country increases, that natives who have become habituated to the wearing of shoes without socks will not be satisfied until they wear the other also. The Burmese men seem to be fonder of hosiery than the people of other parts of India, and they wear them when they can afford them, although, singularly enough, this practice is not shared by their women. For the Europeans, Anglo-Indians, and the better-class Indians cotton hosiery is purchased very largely from the United Kingdom and the United States, and judging by the displays in windows, from advertisements, and from information gathered, the latter country appears to have the bulk of the business. Not only in better-class shops but also in the bazaars, every one of the well-known makes of United States hosiery are to be found. As the hosiery for this market can very well be made in Canada, manufacturers should endeavour to secure a share of the trade, and if they can compete with the United States there should be no doubt as to the result of a strong attempt to secure a foothold.

There is a demand, comparatively small, for woollen hosiery for use in cold weather, particularly in the hill districts, and also for people going home during the winter.

UNDERWEAR

There is a very good market in India for underwear, but as far as the bazaar trade is concerned it is almost entirely supplied by Japan, which makes a very good undershirt or singlet. It is unlikely that any Western country can compete in this trade under present conditions, the quality being of the cheapest. For Europeans there is a comparatively good sale for underwear made in the United Kingdom and the

United States, both in the form of combinations, and in singlets and pants separately. This thin underwear is of all kinds—that is cotton, cotton mesh, Indian gauze, etc., and the best-known makes in the two countries, particularly in the United States, are represented.

Braces.—French-made braces are the most popular in India, although they have advanced enormously in price since the war. An English imitation of the French braces is sold in fairly large quantities. In addition to these there is one very well known United States make, but apparently dealers are of no two opinions of its value when compared with the superiority of the French article. The market is one that is worth cultivating. It would be to their advantage for Canadian manufacturers to take a leaf from the book of the English firms and turn out an article similar to the French one. The most noticeable difference of the latter is that the elastic is confined to the ends of the back.

Garters.—The sale of garters is almost entirely confined to well-known American makes.

SHIRTS, COLLARS AND TIES

As shirts can be cheaply made in India, it is probable that imports are infinitesimal compared with the numbers that are made locally. Certainly shirts worn by the Indian population are probably almost entirely locally made by hand, and even the Europeans in most cases have their own made to order.

English collars are the most popular and are usually sold in the double pattern, and also in turned-down corners for dinner dress. Probably the demand for stiff collars cannot be large, as owing to the heat men prefer either a soft cotton collar, or one that is loose and made of the same material as the shirt.

Neck-ties are almost entirely imported from the United Kingdom, although a small number comes in from France and the United States.

READY-MADE CLOTHING

Practically all of the ready-made clothing imported into India, for men and for women, comes from the United Kingdom.

CORSETS

The demand in India for corsets is not large. Indian women only wear them who have adopted European customs, and these are exceedingly few in number. According to the dealers the demand is for the usual pattern sold in the United Kingdom and the United States, both of which countries are represented in probably equal amounts.

WOOLLEN GOODS

There is a considerable demand for woollen goods of various kinds. In addition to the imports of hosiery which have already been given, piece-goods were imported in 1919-20 to the value of Rs. 1,27,00,000, and shawls to over Rs. 1 lac. In addition to this, the Government imported over Rs. 23 lacs worth of hosiery and over Rs. 46 lacs worth of piece-goods. Nearly Rs. 11 lacs worth of carpets and rugs were purchased, of which over Rs. 5 lacs came from the United Kingdom. As Canada turns out an excellent class of woollen hosiery and some very good tweeds, it is more than likely that if these were made known to Indian importers, particularly in the northern parts and in the hill districts, they might find a sale. In regard to clothing, it should be understood that of the average Indian is exceedingly simple and consists in the warm weather of a small shirt, and what is called a dhotie, which is simply a piece of cotton wound round his body. In the towns, outside of the coolie and lower classes, a pair of shoes is worn, although, as has been already stated, socks do not always accompany them. All the wants of the poorer classes are entirely supplied by the country. Cotton

is manufactured in the Bombay and Madras Presidencies, the shirts are made by native tailors, and as the dhotie is wholly a piece of cloth it requires no making at all. The shoes worn are those of local make. Probably the first imported article that the average Indian wears, is a pair of socks, and with them also probably a pair of garters.

UMBRELLAS

Umbrellas are popular in India, as they are very largely used by Indians during the summer months to protect their heads from the rays of the sun, and they are also necessary on account of the heavy rains that are prevalent during the monsoon period. The imports of umbrellas were valued in fiscal year 1919-20 at Rs. 7 lacs, and umbrella fittings at Rs. 13 lacs, or about Rs. 20 lacs in all. The majority of the umbrellas are of cheap cotton material with common handles to correspond.

CHAPTER XVI

The Market for Miscellaneous Products

TYPEWRITERS

The sale of typewriters must be largely on the increase, to judge by the signs, as they are used everywhere in India. In 1913-14 the imports amounted to something over Rs. 11 lacs, whereas for year ended March 31, 1920, the figures had increased to over Rs. 18 lacs. The business is almost entirely in the hands of American manufacturers, and undoubtedly the enterprise of two or three of these firms deserves success. They not only widely advertise but practise the most aggressive methods. One or two of them have opened typewriting schools, which are not only of great service to the country, but form excellent media for advertising their goods.

It is satisfactory to note that one Canadian machine is quite well-known on the Indian market. From the observations of the agents, it should not be difficult to increase the sales beyond their present volume, the machine being well-liked and filling a certain want. Further, the fact that it is manufactured in Canada is not without its business value, especially where such a type of machine is required for Government offices.

CASH REGISTERS

Cash registers are not extensively used, although, like most modern improvements, they will no doubt be adopted in time.

TWIST DRILLS

There is a good demand in India for twist drills, and as far as can be gathered the business seems to be fairly well divided between the United Kingdom and the United States. Twist drills are made by several manufacturers in Canada, who should be able to compete in this market quite easily, indeed they are probably already finding their way out through New York commission houses.

PUMPS

The market in India for all classes of pumps can be considered good, both for power and hand. This business is likely to increase owing to their extensive use for irrigation purposes, small pumps suitable for connecting to low-powered kerosene engines being in considerable demand. One importer mentioned that he had sent an order to Canada for this class of pump, but although it had gone in many months before, he had heard nothing further of it. In view of the fact that irrigation plays an enormous part in the agricultural life of the country, and that about 30 per cent of

it is done from wells, there should in time be a huge sale for small pumping plants. If the ryots could be assisted in the purchase of cheap plants either through co-operation or by some other means, the market would at once expand. The appliances at present in use for lifting water from wells are about as primitive as it is possible to imagine, and probably the type has not changed in the last two thousand years. Not only would power enable the ryot to perform his irrigation more easily, but it would save the heavy strain that this labour imposes upon his cattle, at a time when they are required for other purposes.

ABRASIVES

Abrasives of most kinds are used in India in the mills and engineering shops, and considerable quantities of carborundum and emery wheels are imported, from both the United Kingdom and the United States. As this class of material is very well made in Canada, it should be a simple matter for manufacturers to get into the trade.

BELTING

The total imports of belting in the fiscal year 1919-20 amounted to a little over Rs. 54 lacs, which shows a considerable decrease over the two previous years. The reason for the decrease is probably that a good deal of hair and leather belting is manufactured in the country. According to information from one of the largest groups of jute mills, the former is extremely satisfactory and is used entirely in spinning sheds. The same firm stated that leather belting, which they use altogether in weaving sheds, is entirely of British manufacture. While they had perfect confidence in the locally made hair belting, this does not appear to extend to the Indian leather belting.

Although the output of leather and hair belting in India may continue to increase, nevertheless with the expansion of the market the demand for the foreign made goods will probably continue over many years, so that the trade is well worth the consideration of manufacturers.

BOBBINS

There is a very large trade in bobbins, shuttles, and plane tree rollers for use in the textile mills. The imports of bobbins for the fiscal year ending March, 1920, amounted to Rs. 38,79,920, and for shuttles to Rs. 9,21,460. During the war bobbins were largely imported from Japan. Although the earlier deliveries were of excellent quality, they later deteriorated very much and the Indian mills were only too glad to return to the British product when that country once more came into the market. At the present time practically all the bobbins, shuttles, and plane tree rollers are being imported from the United Kingdom. During the war a certain number of bobbins were imported from Boston, Mass. One large importer thought that Canada should be able to compete in this trade, and stated that he would be glad to hear from any of her manufacturers interested in the market.

DROP FORGINGS

There is a very good demand in India for drop forgings in the form of spanners, etc. Apparently the United States have the greater share of this business. Drop forgings are also made in engineering shops in India, but as far as observation went the quantities are not large.

VALVES, TAPS, COCKS, ETC.

The trade in valves, taps, cocks, etc., is a satisfactory one. Although brass goods of this class are now being made in the country, the bulk of the articles used are imported, and very largely from the United States. The opinions expressed by

importers in regard to the local articles were that in normal times, and with exchange at or about par value, they would not be able to compete with consignments from overseas.

FORGES

There is a fair demand for portable forges. The trade seems to be fairly evenly divided between the British and the American types, according to the preference of the importer.

Musical Instruments

PIANOS

The imports of musical instruments of all kinds in the fiscal year 1919-20 were valued at Rs. 11 lacs—about the same as for 1917-18, but about 25 per cent below 1918-19. Canada should be in a good position to compete for the piano trade in the Indian market. At the same time it must be definitely understood that only a piano specially made for the tropics will have the slightest chance of success. While a trial order might be given for an ordinary piano, it can be taken as certain that unless it be made according to the specifications given below, there will be no repeat order. Pianos are being imported from the United Kingdom and the United States, and Germany will of a surety shortly be in the market again. The purchasers of pianos in India are almost entirely made up of Europeans and Anglo-Indians, as the natives themselves as a rule only go in for an instrument, which by some is called a harmonium, and by others a hero flute. The following are two specifications for pianos which were given by firms in separate parts of the Middle East:—

Specification No. 1

“Case.—Must be made of solid wood as veneer will peel. Teak is preferred owing to its lightness and strength, but primarily because it is the only wood that successfully resists dry rot and white ants. The latter bore through into any other variety of wood and quickly destroy it.

“Polish.—French is preferred although tough varnish would probably do. Black and dark shades of mahogany are usually preferred, although a natural or waxed finish might be acceptable.

“Construction.—Back posts, frame and wrest plank should be built as nearly as possible integral, that is, blocks should not be used between the posts but rather have the top and bottom planks mortised for the posts to dovetail into. Usual construction but all ribs should be screwed or dowelled on, and sound-board should have a cap screwed around edge on top side reinforcing the glue holding same in place. Bolts for plate should go right through the top and bottom of the piano, and be secured with a nut on back. If this is not done the parts will pull away. Most people prefer a wire gauze on the back as it keeps out the numerous insects with which the country abounds.

“Strings.—It is imperatively necessary, owing to the humidity of the atmosphere, that the strings should be copper-plated. The best steel wire rusts very quickly. Brass strings must in all cases be copper wound. The less felt that is used for insulating the strings the better, as it holds the moisture and is the cause of string breaking. There are some pianos made locally in which felt is entirely eliminated but do not think they are common; these were specially designed. If not possible to dispense with an insulator, try a light lead foil.

“Tuning pins.—These should not fit too tightly as the wrest plank will be bound to swell considerably.

“Keys and action.—Celluloid has been found to be the most satisfactory. It is put on in one piece, head, tail and front and brought over top of key and held in

place at back end in a similar manner. In this way the top front edge of key is rounded and there is no overhang or flange to catch the clothes and eventually be ripped off. Buttons must also be secured with brads. All felt on the action should be secured in a similar manner to the felt on the hammer heads. Centres should be loose. Springs should as far as possible be made rust-proof, and particular attention should be paid to black leading and soap stoning jacks and butts. Dowel actions are much preferred to abstract actions as there are less joints to give trouble. All wood should be thoroughly seasoned but not too thoroughly kiln-dried as the excess of moisture at certain periods causes the wood to swell exceedingly. In many foreign-made instruments $\frac{1}{4}$ -inch to the foot is allowed. The glued portions should be reinforced wherever possible with screws or dowels. This is absolutely essential if the instrument is to remain intact for any length of time."

Specification No. 2

"Instrument.—The instrument must have a complete iron frame, perfected overstrung scale, with bushed wrist pin-holes.

"The iron frame will be bolted with bolts and nuts and a metal clip on back. The bracings to run from *extreme bottom to top* so as to be clamped between iron frame and metal clip at top with the bolts. The sounding board and bars well glued and screwed, small blocks on tails of bars with screw passing through from front of S.B. into blocks.

"Action.—All hammer felts to be riveted; all dampers, checks and heathers notch and jack felts to be sewn. Metal flanges (if possible with easing screws as Bluthner), soft pedal, half blow action, and sustaining pedal.

"Keys.—Key to be covered with celluloid, in one piece and pinned front and back. Key chasing pinned, if carriage or pilot blocks to be screwed, sharps to be screwed.

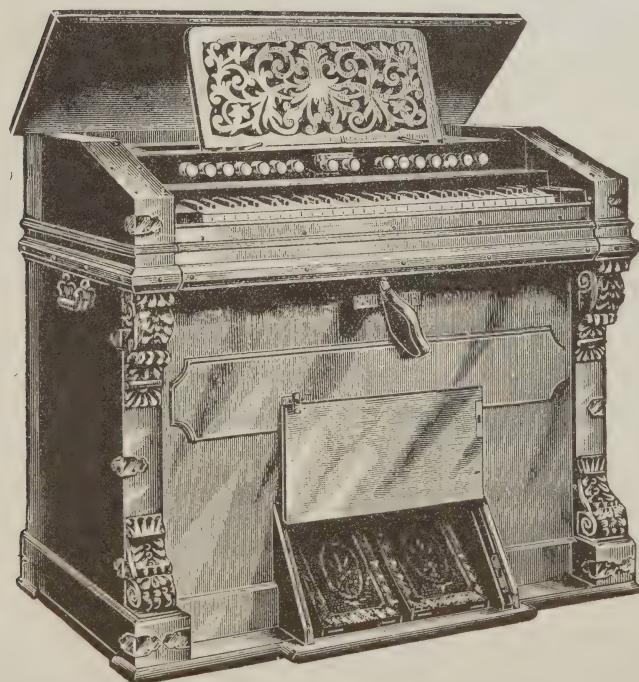
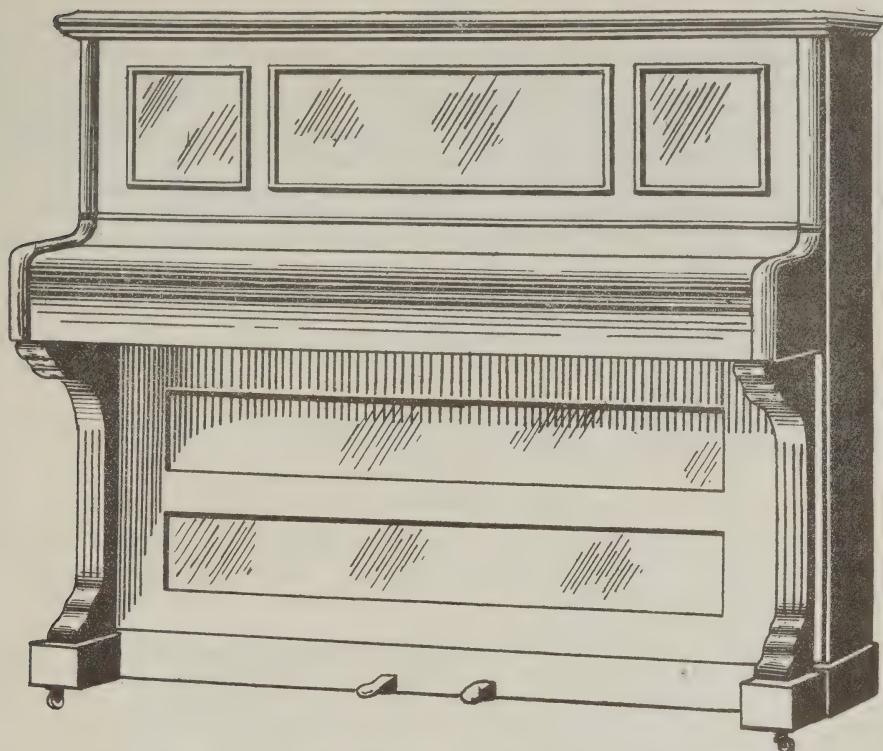
"Case.—Solid mahogany ends in one piece, also top and fall. Dimensions: height, 4 feet 2 inches; width, 4 feet 8 inches; depth, 2 feet 4 inches. All mouldings to be well screwed. Brass screws to be used throughout in case. The back will have metal gauze. The pedals will be mouseproof. The bottom to be perfectly closed. Strong casters to be fitted. Back slips to be polished. Ends and tops should be screwed with not larger than $\frac{1}{2}$ -inch headed cross screws, oval heads preferred. Slightly countersunk, *no washers*.

"Player action.—88 notes to take standardized rolls; purses on pulls to be of thin leather—thin brown leather. Pneumatics covered with best rubber cloth. Linen covered rubber pipes and leads."

As both British and American firms are willing to make pianos as they are specified for by importers in the Middle East, it is very essential that Canadians should do the same. Such pianos could not only be sold throughout India, Ceylon, Malaya, and the Netherlands East Indies, but would also be perfectly suitable for the West Indies and the tropical countries bordering on the Caribbean Sea and the Gulf of Mexico. One importer stated that he would be very pleased to hear from Canadian makers, and glad to give them an opportunity to compete. It is said in India that pianos do not stand the climate of the tropics at all well, whereas in the case of organs the contrary is the case, the latter seeming to be little affected by either heat or cold, dryness or moisture. It is most important that the wood used in pianos should not be veneered. With regard to price, the demand is for a cheap-to-medium grade.

PIANO PLAYERS

There is a fair sale for players of which dealers specified that they shall have 88 notes to take standardized rolls.



ORGANS

The organs usually sold in India are of a cottage model, and should range in price from £40 to £70 f.o.b. steamer. The demand is not large, and is chiefly confined to churches and missions, although a few also are taken on private account. The imports are practically entirely from the United States. The manufacturers of that country are very enterprising in the manner in which they keep importers supplied with catalogues and other literature. As Canadian manufacturers can compete with those of the United States in other parts of the world, they should have no difficulty in doing so in India, although as already indicated they must not expect to find a large market.

OTHER MUSICAL INSTRUMENTS

There is a very good sale for gramaphones and for gramaphone records. One American firm are making song records in this country in the vernacular, but the ordinary record is imported.

Illustrations are given on the preceding page of an upright piano and an organ, both of which are said to be popular in the Indian market.

ASBESTOS

The imports of asbestos into India, as shown by the statistics, were valued in 1919-20 at Rs. 3,06,570, practically the whole of which were for manufactured articles. Asbestos is used in India for insulation purposes, for packing, and also in the form of boards and sheets for building.

One firm stated in the course of an interview that they were importing asbestos millboards in sizes of 40 inches by 40 inches, and from $\frac{1}{8}$ inch to $\frac{1}{2}$ inch in thickness, the greatest demand being for sheets of $\frac{1}{8}$ inch to $\frac{1}{4}$ inch. Asbestos is also imported in the form of metallic surface sheets with and without brass wire insertion. Another firm mentioned that before the war they had been handling corrugated asbestos sheets from Canada, but had lost the trade during the war and were most anxious to regain it. The flat sheets are used in India for partition walls and for ceilings, and the corrugated sheets for roofing. One disadvantage in regard to the shipping of asbestos sheet is the very high percentage of breakages incurred in transport, which has a considerable effect on the price. If these could be reduced it would have a very beneficial effect on the trade, as this material is most suitable for certain classes of buildings. The United Kingdom holds the greater share of the trade in asbestos, not only in packing but also in plain corrugated sheets. This is probably owing to the aggressive representation which one of the big manufacturers has in India. Asbestos sheets are also imported from Holland, Belgium, and Australia. The Belgian product is well spoken of, one point in its favour being that it gives a very clean sewing edge.

Packing and jointing is sold in various forms such as sheets, ropes, yarns, floss, etc., and also in tapes, and in sheets with rubber cord. The imports of engine and boiler packing of all kinds into India, including asbestos, reached in fiscal year 1919-20 a value of Rs. 10 lacs, and for the first two months (April and May) of 1920-21 Rs. 63,000. A well-known Canadian packing is sold in this market, which gives every satisfaction.

In view of the fact that Canada produces a very large percentage of the world's supply of asbestos, one would think that it should be a simple matter for her to hold the lion's share of the trade in such a market as India.

ROOFING

In seeking information in regard to the employment of prepared roofing in India the writer was met with a variety of opinions, but the conclusion was reached that there is a fair sale for this article. It is not separately entered in the statistics, conse-

quently it is impossible to estimate the quantity used, but judging from the statements of importers, two or three makes—one in particular—appeared to have worked up a very satisfactory business. One large firm stated that they were importing their roofing from Canada. Although this roofing is affected somewhat by the climate, it seems nevertheless to stand up fairly well. It is not only used on large office buildings, stations, etc., but also for covering railway carriages. According to a report made some years ago by the American consul at Bombay, United States roofing has been used to cover the Talla water tank in Calcutta, which holds the city's water supply, and is said to be the largest of its kind in the world. The American firm who appear to supply most of the roofing maintain their own staff of erectors, and no doubt such a policy assists very much in its sale. Practically the whole of the demand for roofing, except such supplies as may come in from Canada, is met from the United States.

EXPLOSIVES

There is a good demand in India for cartridges, which are entirely supplied by the United Kingdom and the United States. Ammunition from the latter country, both for rifles and guns, has come into favour within the last few years. This is a business which Canadian manufacturers might well consider. The same remark applies to explosives for blasting purposes.

FIREARMS

The imports of firearms of various kinds, such as guns, revolvers, rifles, etc., were valued in 1919-20 at over Rs. 12 crores. At one time a Canadian rifle was sold in India, and every importer who has handled it spoke of it in the highest terms as being one of the finest sold on the market. One man in praising it referred to almost a record number of panthers which had been killed with an equal number of cartridges; this he put down to the hard-hitting powers of the rifle, as apart of course from the fine shooting of the hunter. In view of the reputation which this rifle has obtained in India, it is a pity that it appears to have been withdrawn from sale.

GLASS

The total imports of glassware into India are large and were valued in 1919-20 at Rs. 2 crores. Japan has fairly established herself in this trade, and for the last three years has been able to capture about three-fifths of the imports. In the first two months (April and May) of 1920-21 Japan showed that she is still holding her own, in spite of all the adverse criticism levelled against her manufacturers.

Glassware is manufactured in India to a considerable extent, although it is not one of the old industries of the country. The manufacture of glassware in India has gone through many vicissitudes and difficulties. The early attempts which were made some thirty or forty years ago generally met with failure. The tendency at that time was towards Japanese methods of manufacture. Men were brought from Japan to manage the factories, and as was natural these workers introduced their own pattern of furnace, which seems to have proved uneconomical. One of the difficulties in regard to the manufacture of glass in India is the need for skilled labour, and while this probably will only be obtained slowly, with time and experience the local industry should expand. At present the glass which has been turned out in India is of a soft soda variety, the use of which is confined to a comparatively small range of articles.

Enormous quantities of mineral water bottles are made in India, the demand being for what is known as Cod's pattern, which apparently is used throughout the country. There is also a very good demand for pharmacy bottles, which are purchased in the United Kingdom. Belgium, well known as a large producer of glass, is meeting with success in re-establishing herself in this market.

POLISHES, BRASS AND LEATHER

The imports into India of all kinds in 1919-20 were valued at over Rs. 21 lacs, and for the first two months (April and May) of the fiscal year 1920-21 these reached a total of about Rs. 6½ lacs. Polishes have now been separated in the statistics into leather and metal, of which in April and May, 1920, leather amounted to Rs. 5 lacs, and metal to Rs. 1,34,000. In addition wood polish to a value of Rs. 9,000 was brought in. Polishes are largely imported from the United Kingdom, although American leather polishes are to be seen everywhere, and one Australian make has established itself strongly on the market.

PLAYING CARDS

There is quite a good market in India for playing cards, but to supply the bazaar demand they must be cheap.

SILVER AND ELECTRO-PLATEDWARE

Under the heading of plate of gold and silver, the imports into India were valued at Rs. 6,36,163 for 1919-20, but just how much of that would come under silver, it is impossible to say. Under electro-platedware, the imports for that year are shown as valued at Rs. 5,43,000, and for the first two months of 1920-21 at Rs. 1,16,000. Silverware and electro-platedware are imported from the United Kingdom and from the United States. According to dealers there is a good demand for tea sets, spoons, forks, flatware, etc. The British make appears to be the most popular, as although it is admitted that the American designs are artistic and attractive, it is claimed that the former wear very much better owing to the fact that the silver is applied to a hard metal as against a softer kind in the case of the latter. Whatever may be said about the product of American manufacturers, they appear to have established themselves fairly strongly within the last two or three years, no doubt owing to the exigencies of the war and to the fact that they make a really artistic article. Apparently in addition to the articles already mentioned, the United States have also established a market for silver chain bags, cigarette cases, etc. The demand in India is chiefly for what might be called everyday silver goods of plain design.

ROLLED GOLD JEWELLERY

Canadian rolled gold jewellery has been imported into this market, and according to those who have handled it, has proved very satisfactory. The only complaint was that sufficient quantities of it were not forthcoming. The demand appears to be for watch chains, neck chains, and cuff links, but not for studs. Watch chains for Burma should be made with a hook, according to information given in Rangoon, but in other parts of India the bar is preferred.

The statistics for rolled gold or imitation jewellery are not given separately, but according to importers there is an enormous market for it. Formerly this trade was entirely in German hands, and no doubt German manufacturers will again attempt to control it. Canadian manufacturers should therefore lose no time in firmly establishing themselves, which they should be very well able to do. One large importer urged that the market should be studied and canvassed by Canadian manufacturers, thus following the example of several large United States firms.

FLY-PAPER

Although fly-paper is rarely seen in India, according to dealers there is quite a fair market for tanglefoot. Advertising would probably materially influence its sale.

PROPRIETARY AND PATENT MEDICINES

There is a very big sale in India for proprietary and patent medicines, not only for imported goods but also for those made in the country. In fiscal year 1919-20, proprietary and patent medicines were imported to a value of over Rs. 30 lacs, and for the first two months (April and May) of 1920-21 to about Rs. 6 lacs. Practically all of the European chemists put up their own preparations, in addition to which there are immense quantities made by Indian chemists. Apparently the Indian has a good deal of faith in the properties of patent medicines, and as far as the poorer classes are concerned they would buy those compounded by their own countrymen, but the better class patronize the imported preparations.

While a fair number of American brands are sold, the English marks are firmly established. One large importing house stated that they had been trying for a considerable time to introduce a certain American line, but that the market would have absolutely nothing to do with it. The bazaar dealers in these things are extremely conservative, and it is very hard to persuade them to handle a mark with which they are not familiar.

TOILET REQUISITES

The imports of toilet requisites into India are considerable, and were valued in 1919-20 at over Rs. 40 lacs, which is a considerable increase over the previous year. The imports for April and May of 1920-21 were valued at Rs. 11 lacs, and accordingly show no sign of a falling off. These toilet requisites are largely British and American, and consist of face creams, tooth pastes, lotions for the skin and hair, etc. The average Indian has a weakness for hair lotions, so that the sale of these is large.

MATCHES

The imports of matches are large, amounting to over Rs. 2 crores in value. As might be expected, Japanese imports figure very largely—in fact the bulk of the trade is in their hands, although the quality of the goods, as far as can be judged, is miserable. But Japanese matches are cheap, and suited to the bazaar trade, in which price is the prime consideration.

OPTICAL GOODS

The imports of optical goods into India for 1919-20 were valued at Rs. 7½ lacs, an increase over the two previous years. In view of the large numbers who wear spectacles and glasses, it is surprising that the imports are not larger. For the two months of April and May of 1920-21 the value was Rs. 2 lacs. Statistics do not show the countries of origin of these goods, but judging from information furnished by importers, the lenses are imported from the United States, the United Kingdom, and France, with perhaps the bulk coming from the first-named. The general opinion among dealers was that France produces the best lenses in the world, and that at a cheaper price than the American article. However that may be, the United States, as has been stated, is the chief source of supply. Canadian optical goods are known in this market, and although not widely, those who have handled them appeared to have been perfectly satisfied with their quality. There is little doubt that if our manufacturers would make an effort they could compete effectively, and it is to be hoped that they will endeavour to do so in the near future.

The business in optical goods is chiefly done by commercial travellers who make periodical trips to India, and from thence continue on through other parts of the Middle East. It is very probable, having in mind the large number of Indians who wear glasses, that the business will become one of considerable importance as the country increases in wealth. By optical goods is included not only lenses but frames of all kinds, and more especially those of rolled gold. Before the war Germany prac-

tically controlled the market in rolled gold frames, and without doubt her manufacturers will shortly be making an attempt to regain their old position. However, considering the present state of that country, it will no doubt be a considerable time before competition from that source will be severely felt.

In addition to the ordinary eyeglasses and spectacles, there is a good demand for coloured glasses of various kinds, used to protect the eyes from the sun and dust. The sun's rays in the cities of India are extremely powerful and, reflected as they are from the buildings, the protection of glasses to soften the glare, which is especially trying in Calcutta, adds very much to the comfort of the wearers. There is said to be a good deal of ocular trouble amongst the people of India, and cataract is very prevalent, but this is not confined to the Indian, as Europeans also suffer from the same affliction.

CEMENT

India has been manufacturing cement for some years, but it is only since the war that she has been producing an article which will measure, or nearly measure, up to the specification of the British Portland cement makers. There are three large works in the peninsula manufacturing cement—one in Central India, one in the Central Provinces, and the third in Kathiawar, on the west coast a little north of Bombay. It is a little unfortunate for this industry that all three works are located at very considerable distances from the great centres of consumption. For instance, the nearest works to Calcutta are some 600 miles away. The consequence is that it is probably cheaper—or may be with the exchange at its par value—to import cement than to incur the expense of this long rail haulage. The same remarks apply to Bombay and the other principal cities. Time may, however, show that the locations of the works are not so disadvantageous as they would appear to be at present.

While it may be claimed that the Indian product is as good as the imported article, this is not borne out by contractors, who affirm that it sets too quickly. As Portland cement is affected by atmospheric conditions, and especially by the humidity which is so prevalent in India during the monsoon period, this with the high temperature has a considerable influence upon the quality of the cement, which, needless to say, is inferior. Another reason given for the Indian cement setting too quickly is that it is not sufficiently finely ground.

The imports of Portland cement for the fiscal year 1919-20 were valued at Rs. 78 lacs, and for other kinds of cement at Rs. 14 lacs. These figures show a considerable increase over the two previous years. In 1913-14 the imports were appraised at about £450,000. The bulk of the cement comes from the United Kingdom, and it is very apparent from the trade of 1919-20 that she has easily regained her prewar supremacy, as in 1918-19 the supplies from that source only reached Rs. 14 lacs in value. In the latter year Japan did a considerable trade, shipping to the value of Rs. 17 lacs. However, the following year showed a decrease of nearly 15 per cent in that country's business, and it is more than probable that the decline will be still more marked in the future returns, as Japanese goods do not bear a high reputation. Another foreign cement which is said to give fair satisfaction is made in Hong Kong, but in referring to it contractors stated that, like the Indian, it sets too quickly.

Now that direct steamship connections have been established between Canada and India, and in view of the immense amount of cement which is manufactured in the Dominion, it should be worth while for manufacturers to make an attempt to establish a trade with the peninsula. Owing to the large amount of building in course of construction, and projected, and the rapidly increasing use of ferro-concrete, it is probable that the consumption in the next few years will be large. It is most unlikely that India will be able to supply her own demands for some time, even under the best conditions, and assuming that her cement is absolutely equal to that of the United Kingdom, which, according to those who should know, it is not.

CHEMICALS

The imports of chemicals into India are considerable and reached in 1919-20 a value of Rs. 1,61,00,000. This is a decrease on the two previous years, and is not a great increase over 1914-15, when the shipments to this market were appraised at Rs. 1,02,00,000. India is ambitious to build up a chemical industry. For this purpose coal is an essential, and as the deposits of the country are almost entirely confined to the provinces of Bengal, and Bihar and Orissa, it will be necessary, if this ambition is to be realized, to centre the chemical industry in those two provinces. In connection with the chemical industry, it should be noted that India is developing a certain amount of hydro-electric power, a cheap supply of which is essential for certain operations, in order to bring about chemical changes economically. But it is doubtful whether it will be possible, owing to the peculiar conditions of the country, particularly those pertaining to climate, to produce it at sufficiently low cost to make it a feasible business proposition. These climatic conditions are, that the rainfall in India occurs only at a certain period of the year, and during the remainder the country is practically dry. As a consequence it is necessary to construct enormous dams, if large quantities of electric power are to be developed. Owing to this fact, it seems almost impossible to produce any large volume of very cheap electric power within the country.

ACETIC ACID

Acetic acid is of much importance to India; and since Canada claims to have the largest plant manufacturing this product in the world, its consideration will probably be of interest.

Before reaching India, the writer was informed that very shortly all supplies of acetic acid for the rubber plantations in the Middle East would be obtained from Burma. However, inquiries made in India and in Burma do not corroborate this statement. As one importer put it, he had been hearing about the manufacture of acetic acid in Burma for the last eight or nine years, and he expected to continue to hear about it for the next twenty.

Fairly large quantities of acetic acid are used on the rubber plantations, to mix with the rubber latex in assisting coagulation. It is estimated that one carboy of this acid containing 44 pounds will coagulate 10,000 pounds of rubber. If this be correct, it is possible to compute roughly the annual consumption of acetic acid throughout the Middle East, as the amount of rubber which is produced is included in Government statistics. Rubber planters are very insistent on the necessity for the purity of acetic acid. It should be 99.99 per cent pure, and absolutely free from the very smallest trace of metal. Unless a very cheap source of power can be found for the destructive distillation of wood, which is necessary to produce acetic acid in the crude pyroligneous form, its manufacture in India is not likely to be an economic success. Considering the possibilities of this industry, Canadian manufacturers should be able to feel fairly assured of a useful market for their product throughout the Middle East for a considerable number of years, if not indefinitely, always providing that a cheaper or more satisfactory coagulant is not discovered.

The rubber plantations of India are situated in the southern part of the peninsula, and almost entirely on its western side. It is there that the market for acetic acid is to be found.

The imports of acetic acid in 1913-14 amounted to 42 tons, which had increased in 1919-20 to 1,712 tons, and for the two months ending 31st May, 1920, the figures were 296 cwt. Ceylon also consumes acetic acid in fairly large quantities. The supplies for the year 1919 amounted to 18,160 gallons, which were entirely got from Japan. It was ascertained, however, by the writer, that a good deal of Canadian acetic acid was being imported into Ceylon, but this trade apparently had only begun in 1920. As direct steamship connection has now been established, the Canadian article should be able to compete with the Japanese, particularly as the former is greatly preferred by importers.

NITRIC ACID

The imports of nitric acid into India are comparatively small, and are not likely to increase to any extent, as this chemical is now being made in the country from Chilean sodium nitrate, and still more so from local saltpetre or potassium nitrate. The method of producing nitric acid in India is extremely crude, nevertheless the output will probably be sufficient for local needs.

SULPHURIC ACID

The imports of sulphuric acid into India are not large, amounting in 1919-20 to about Rs. 1 lac in value, or in quantities 4,729 cwt. These figures represent a very considerable increase over the two previous years. Sulphuric acid is made in India by burning Italian sulphur and passing the fumes through a lead chamber. It is also made at the Bengal iron works by burning Japanese sulphur in combination with ammonia which is a by-product from the coke ovens. In addition to this it is also manufactured in the vicinity of the Tata iron works from the zinc concentrates obtained from Burma from the production of spelter. Sufficient quantities of iron pyrites are not available in India for the manufacture of sulphuric acid by the process which is usually followed in other parts of the world. Although India is pretty well able to supply itself with sulphuric acid, there will always probably be a market for the highest quality, as the local article cannot reach higher than a concentration of 1.740 sp. gr., while there is a limited market for a concentration of about 1.840 sp. gr.

HYDROCHLORIC ACID

Another acid which is made in India is hydrochloric acid. India is able to supply all her requirements of this product, as from 5,000 to 10,000 tons per annum are manufactured in the country.

BLEACHING MATERIALS

India being deficient in a cheap supply of chlorine does not appear to be well situated for the manufacture of bleaching powder. But if with the development of electric power in the future, caustic soda should be manufactured, bleaching powder might then be made as a subsidiary industry. As there are no immediate prospects of this condition arising, the imports of bleaching powder are likely to continue to increase for some years, one of the contributory causes being the expansion of cotton manufactures. It is unfortunate that India is not in a position at the present time to supply her own requirements of bleaching powder, as owing to climatic conditions this commodity is inclined to be unstable.

SODIUM CARBONATE

Sodium carbonate is imported into India in large quantities; those for the year ended March 31, 1920, amounting to 23,981 tons, a decrease from the previous two years. For the two months (April and May) of fiscal year 1920-21, the imports amounted to about 1,700 tons. Sodium carbonate is found in fairly large quantities but in rather a crude state in the interior, so that it is questionable whether it would pay to work these deposits to any large extent. Sodium carbonate can be imported in very large quantities from East Africa, and this is now being done by a Calcutta firm of managing agents.

CAUSTIC SODA

The imports of caustic soda into India amounted for the year ending March 31, 1920, to about 5,000 tons—a considerable increase over the previous year, but a decrease as compared with 1917-18. The supplies come almost entirely from the United Kingdom. As already stated, one of the large firms of managing agents in Calcutta is importing sodium carbonate from East Africa and has now begun the

manufacture of caustic soda. Heretofore, the importations of caustic soda have been almost entirely in the hands of one very large British firm, which appears to have been successful in keeping down competition. The local firm referred to, owing to its supplies of sodium carbonate from East Africa, is developing a strong competition, and one that will probably shake the position of its competitor on the Indian markets.

CALCIUM CARBIDE

The importation of calcium carbide into India is of considerable importance to Canada, owing to its extensive manufacture in the Dominion. Canadian carbide is now coming into India, and from inquiries made by the writer it appears that the importations are large.

The demand for calcium carbide in Ceylon is small and is practically confined to engineering establishments in the maintenance of oxy-acetylene welding plants. Not being given in the Customs statistics, it is impossible to say just to what volume the imports have attained, but presumably they were small. With the inauguration of direct steamship service between Eastern Canada and the ports of India, no doubt this will have a beneficial effect upon the trade, and should be of considerable assistance in establishing Canadian calcium carbide on this market, very possibly to the exclusion of the product of other countries.

The imports of calcium carbide into India are not large, and have fallen off considerably since the introduction of electric lighting in motor cars. It is used largely for oxy-acetylene welding, for use in the mines, and also in lamps, which are in large demand for the festivities in connection with Hindu weddings. Dealers say that in the month of May, when weddings are largely celebrated, the demand for calcium carbide jumps up most perceptibly.

The imports before the war amounted to about 1,000 tons per annum and came largely from Germany, Norway, and the United Kingdom. In 1917-18 they amounted to 642 tons, in the following year to 2,141 tons, but for the year ending March 31, 1920, they were only 377 tons. The supplies received for the first two months (April and May) of the fiscal year 1920-21 showed an increase over those received for the whole of 1919-20, amounting to 380 tons. Practically the entire quantity was received during May.

Calcium carbide is not made in India, although strong hopes are entertained for the future. If this aspiration is to be realized, it will be necessary to supply electrical energy at a very much cheaper price than has been the case up to the present. India is well off for raw materials for the manufacture of this product—that is quicklime, and coal or coke, but Indian coal shows rather a high percentage of potash and of phosphorus. The Indian Munitions Board, in their survey of Indian industries, apparently took a hopeful view of the possibilities of the manufacture of this commodity. "Such figures as are available, suggest that there would be a considerable margin of profit on the manufacture of calcium carbide in India, in consequence of which it would probably pay to manufacture not only the carbide required in India, but also other products manufactured from carbide, namely, the impure calcium cyanamide, known commercially as nitrolim, and sodium cyanide." It is thought, however, that the Indian consumption of these materials cannot be sufficient to justify the installation of a plant of sufficiently large capacity to be operated on an economic basis, and consequently a proposal is made that the plant should be designed to produce 6,000 tons of carbide annually. It is suggested that this product might be manufactured either by means of electrical power generated from Mond gas, or from power derived from a hydro-electric system. The cost of manufacture is based on the price of electrical energy at £4 15s. per kilowatt per annum.

DISINFECTANTS

India imported for the year ending March 31, 1920, nearly Rs. 8 lacs worth of disinfectants. As large quantities of tar are produced locally, the manufacture of disinfectants is a native industry. According to chemists, it is difficult to make a

good and cheap tar owing to the inferior quality of Indian coal, and it is therefore probable that India will not be able to become self-contained in the supply of disinfectants. As the application of the science of sanitation is spread in India, and an appreciation of its value becomes more widely diffused, the use of disinfectants will rapidly expand.

ALCOHOL

Considerable quantities of alcohol are manufactured in the State of Hyderabad, from the flowers of the Mahua tree, which are said to afford a very large source of supply. According to Dr. Fowler, professor of Applied Chemistry in the Indian Institute of Science at Bangalore, there are in operation in Hyderabad every variety of fermentation and distillation plants, from small primitive stills of a few gallons' capacity to large ones capable of dealing with 10,000 gallons of mash per day and provided with modern equipment. One distillery is capable of producing large quantities of alcohol, the maximum daily output being 10,000 gallons.

Inquiries were made in 1920 by the India Office in connection with the manufacture of power alcohol from the Mahua flowers, but after investigation the Government of the Central Provinces reported "that not only is the Mahua crop no more than sufficient for local consumption, but that attempts made by Barry & Co. to produce motor spirit, capable of competing with petrol at the present prices, had not proved successful." The question was also considered of exporting Mahua flowers to Europe, but this was not considered feasible owing to the high freight rates and other circumstances. The report referred to above also stated that "a plant capable of turning out 360,000 gallons per annum of 96 per cent alcohol is being installed. An ether plant capable of producing annually 100,000 gallons of ether is also being installed in a factory, which is situated in the heart of the Mahua-growing district. Arrangements are being made to produce alcohol for industrial purposes and an admixture with ether for power purposes. . . ." The factory is designed to allow a limited extension, but the size will depend upon the raw material available, and it is estimated that the maximum output possible from flowers obtainable within a practical radius of the works is about three times that at present contemplated, namely, 1,080,000 gallons.

The flowers of the Mahua tree are of waxy whiteness, and contain from 40 to 60 per cent of fermentable sugar. A certain amount of scepticism is expressed in regard to the success of the venture which has just been outlined. It will, however, like so many other Indian ventures, be thoroughly tested out in the next three or four years, as the day of producing commodities without regard to cost is past, at least for the present.

CHAPTER XVII

The Market for Railway and Government Stores

The majority of railways in India are either owned or controlled by the State, although those which come under the latter category are still managed through their own home boards of management located in London. The State railways purchase their requirements through the India Office, the practice being to make up annual indents and forward them to this office, which purchases the stores from United Kingdom manufacturers whenever such is possible. The lines worked by companies and those which are under private control are managed, as a rule, through their boards of management in London, and it has been the practice to purchase their requirements in stores at headquarters in that city.

A committee has recently been sitting to inquire into the practicability of the railways purchasing their stores more largely in India, and it is understood that recommendations have been made by it that if possible this procedure should be adopted. The railways complain that they have not sufficient funds to keep their equipment in proper running order.

Owing to the deterioration of equipment which has taken place since the commencement of the war, and the fact that replacements have been made on an entirely inadequate scale, Indian railways are very urgently in need of enormous quantities of all classes of supplies, and without doubt rolling stock more than any other. The visitor hears on every side of the congestion which apparently reigns on most of the Indian systems, and it is affirmed that it would be practically useless for India to increase her production until the railways are in a position to handle it adequately.

In connection with the question of railway stores, the following is taken from the speech of Major-General Freeland, agent of the Bombay, Baroda and Central India Railway, who presided at the Indian Railway Conference held at Simla about the middle of October, 1920. Amongst other things he said: "I think you will agree with me that since this time last year, the general conditions of railway maintenance and operation have not greatly altered for the better. Reconstruction and the supply of new equipment have been delayed by the fierce competition all over the world, by the shortage in shipping, and by labour difficulties in England, and it is as necessary as it was a year ago, to make up our deficiencies in rolling stock, and in running, marshalling, and terminal facilities by improved methods of working."

PROSPECTS OF RAILWAY DEVELOPMENT

Referring to prospects of development, Major-General Freeland said: "As was to be expected, the moment conditions of war were thought to have passed away, a constantly increasing pressure was brought to bear on the railways to revert to their pre-war practice without delay and to effect a rapid improvement on the 1914 standard of transportation. That this would be so was foreseen, and such steps as were permissible under the existing system of annual budget grants were taken to place orders for material and new equipment both in England and in India. Unfortunately the whole world has suffered and every country was in violent competition for the supply of manufactured material—steel in particular. Frequent strikes and labour unrest in England slowed down the output of the workshops there, and shipping during 1919 at any rate was very short, consequently much of the materials and stores ordered immediately on the conclusion of the war for the reconstruction of our railways was not forthcoming within the period for which the grants have been made. There is no getting away from that. Furthermore, it is only fair to recognize that the purchasing power of money is barely half what it was in 1914. If £12,000,000 was necessary for railway development then—and that be it remembered was inadequate for the needs of the country—it is necessary now to raise at least

£24,000,000 to do the same work. Very much the same state of affairs exists as regards our annual revenue budget grants. From the financial point of view, has any plan been made to provide for renewal of locomotives, carriage and wagon stock, permanent way and bridges, which have been deteriorating steadily since 1914? I do not think so. Such renewals can only be carried out gradually. There are unmistakeable signs that our programme will be ruthlessly curtailed in the near future, because it would be difficult to raise money, and because no reserve fund was created during the last few years to meet the renewals which would obviously have to be undertaken sooner or later, if railways were not to be closed down.

"The only way to put matters right is the adoption of a more liberal and flexible financial policy in future. It is most distinctly contrary to the interests of India as a whole, to her trade, her education, and her industrial welfare if, because it is a lean year, or because money cannot be raised except at a higher rate of interest than is in keeping with past practice, our revenue and capital grants are to be curtailed for the next financial year. Such a policy is shortsighted in the extreme, for to curtail expenditure in one year will only accentuate the difficulties in the next."

The Hon. Sir George Barnes, a Member of the Government of India, in the course of the same meeting said: "I rather gathered from what Major-General Freeland said, that he thought the Government if they wished could do more for railways in the way of finance and borrow more. I should like to tell all of you that we have borrowed all the money that we can. I think that you will agree that the terms which have been offered this year are as liberal as a solvent Government ought to offer. Six per cent free of income tax is, I should have thought, a tempting offer. Now the present position is this. It is quite clear that India wants a great deal of money to spend on railways, both for open line and for new construction. It is quite clear that during the next two years we have got to pay off a very large amount of short term debt, something over Rs. 30 crores. That is within the next two years. Well, the deduction I am bound to grasp is this, and I am sorry to say, that our Finance Member has warned me on the subject, that there would be very little that he can give us for new railway construction. If we get enough to keep our open lines in order it is all that we shall get from the Government."

The quotations which have just been made throw considerable light on the necessities of Indian railways, and their present difficulties, especially those relating to finance. In view of the fact that the Indian railways make a handsome return on their capital, and provide a considerable source of revenue for the Indian Government, it is unfortunate that they should suffer so acutely from shortage of funds. There is little doubt that railway congestion is one of the most serious problems that India has to solve; but the solution can never be arrived at until there is sufficient supply of railway rolling stock and all the other material which is necessary to keep a railway system in efficient running order.

What has been written in these last paragraphs will give the Canadian manufacturer some idea of railway conditions as they exist in India at the present time. The railways have been so successful in the past, and have contributed so enormously to the prosperity and well-being of the people, that their necessities will have to be met, and there is no question but that very large supplies of material will have to be purchased within the next five years. Canadian manufacturers desirous of quoting for stores for the Indian railways should place themselves in touch with the India Office in London, and with the London offices of all the company-managed and privately-owned railways, in order that their names may be placed on the books of the respective offices as offering to quote on trade requirements. Railway wagons made in Canada have been received comparatively recently by one of the large Indian railways. To inquiries made as to whether these wagons were giving satisfaction, information was elicited that they had not been running a sufficient time to be thoroughly tested, but as far as experience had gone, they had proved to be quite satisfactory.

Railway carriages and wagons have been made under emergency conditions in India, and one Calcutta firm has erected shops for the purpose of building all classes of carriages and wagons, but it is understood that the plant has not yet been installed. It is also reported that one of the strongest and best-known manufacturers of railway rolling stock in England intend to erect branch works on a very large scale in India. With regard to the latter, while action seems to have been taken, no mention is made of it in the *Indian Investors' Year Book* for 1920. According to the head of one of the largest industrial concerns in the country, whatever manufacturing of railway material may be done in India, it will be necessary, at least for the present, to import tyres, springs and buffers, owing to the local difficulty of making steel castings.

There is a local demand for leather and cloth for upholstering carriages, and also for all classes of railway car hardware.

Rails are being rolled at the Tata iron and steel works up to 90 pounds, which is the standard weight for the standard gauge railways, and predictions are made that eventually these works, either by themselves or in combination with other works, will be able to supply the whole of India's needs, as well as those of neighbouring countries. These, however, are mere forecasts, and it is very doubtful if optimistic anticipations of this kind will be realized in the near future. The next few years will be crucial ones in the industrial history of India, and they will doubtless throw a great deal of light upon the possibilities of industrial expansion in that country within the next quarter of a century.

Canadian manufacturers of railway material would be well advised to lose no time in placing themselves in touch with the India Office and with the London offices of the respective lines, so that they may be able to take full advantage of every opportunity which presents itself. Canada is very well equipped for the manufacture of railway rolling stock, for rails and other material, and with direct steamship connections, the greatest consideration should be given to prospects in the Indian market, and every effort made to secure a foothold. Probably the best course to pursue would be for manufacturers or their representatives to call at the London offices just referred to, as more can be done by direct personal effort than through correspondence.

IMPORTS OF EQUIPMENT

For the year ending 31st March, 1920, the total imports of railway plant and rolling stock are shown to have been valued at Rs. 4,58,72,000—a business of considerable importance. Of these, carriages and wagons represented no less than Rs. 3 crores. In addition to the returns just quoted, the Government of India imported railway plant and rolling stock in the same year to a value of Rs. 4 crores, of which carriages and wagons and parts thereof amounted to Rs. 3,58,00,000. Thus the total imports of rolling stock in 1919-20 was valued at over Rs. 7 crores. This item in the statistics is well worth the attention of Canadian manufacturers. The Chairman of the Railway Conference, as has been shown, referred to the fact that the delivery of orders is very much in arrears. In view of the fact that the United Kingdom has been passing through a series of labour crises, further accentuated by the miners' strike, it is likely that all orders will be still more behind hand, and for the completion of these firms within the Empire may find themselves in a preferential position. Canadian manufacturers should take immediate steps to secure a share of this trade, as there are numerous representatives of United States firms in India at the present time who are just waiting an opportunity to cut in.

As far as the manufacture of railway rolling stock in India is concerned, there is no need to be unduly concerned about it until it comes actually into operation and is fully tested by results. There is just a little doubt whether there is quite as much enthusiasm in regard to founding industries in India to-day as there was two years ago. Conditions were very different then and now. It is one thing to manufacture when cost is not a determining factor, and another when conditions are

normal and competition is exceedingly keen. One large Indian firm stated that they were very anxious to secure an agency for electric power signalling apparatus, and they hoped that it might be possible to secure this in Canada. Their desire is to enter into competition with one of the large manufacturers of the United States, who have established a connection among railway companies in the peninsula.

MISCELLANEOUS GOVERNMENT STORES

The following table shows the import of Government stores, which might be supplied by Canada, for the fiscal years ending March 31, 1919, 1920, 1921:—

PRINCIPAL ARTICLES	Value, Twelve Months, April 1 to March 31		
	1918-19 Rs.	1919-20 Rs.	1920-21 Rs.
GOVERNMENT STORES—			
BOOTS AND SHOES	6,86,343	26,946	13,96,596
BUILDING AND ENGINEERING MATERIALS, <i>other than of iron</i> —			
Cement	26	98,588	6,18,054
CARRIAGES AND CARTS (<i>excluding railway carriages</i>), and parts thereof	18,09,349	37,51,339	69,30,215
CHEMICALS	26,48,287	11,10,291	10,70,787
COAL, COKE, AND PATENT FUEL	6,65,521	10,420	.....
DRUGS, Medicines, and Narcotics	22,76,339	20,09,467	21,09,472
GLASS AND GLASSWARE	7,01,456	3,64,004	5,62,934
HARDWARE and Cutlery (<i>including agricultural implements and plated ware</i>)	1,04,06,491	87,00,214	86,77,852
INSTRUMENTS, Apparatus, and Appliances, and parts thereof	46,04,079	41,91,197	60,27,944
LEATHER and manufactures (<i>excluding boots and shoes</i>)	9,76,049	49,356	79,011
LIQUORS	15,215	1,57,945	56,680
MACHINERY AND MILLWORK	38,25,373	48,70,394	80,10,454
PAPER AND PASTEBOARD	9,27,634	13,18,345	9,77,441
PRINTING AND LITHOGRAPHING MATERIALS (<i>excluding paper</i>)	2,29,139	2,69,716	4,25,647
RAILWAY PLANT AND ROLLING-STOCK—			
Carriages and wagons, and parts thereof	44,10,213	3,57,78,780	1,00,33,190
Locomotive engines and tenders, and parts thereof	18,33,443	44,06,973	1,21,97,876
Materials for construction—			
Rails and fishplates of steel or iron	3,262	40,93,352	5,65,516
Sleepers and keys of steel or iron . . . . .	.....	.....	.....
Other sorts	1,05,987	3,41,383	1,24,954
Total	63,52,905	4,46,20,488	2,29,21,536
SHIPS, PARTS OF (<i>including LAUNCHES AND BOATS</i>)	1,84,751	1,95,217	8,17,858
STATIONERY (<i>excluding PAPER</i>)	30,78,551	27,12,885	28,04,905
TELEGRAPHHS, MATERIALS FOR CONSTRUCTION OF	23,24,398	57,89,768	34,34,679
TEXTILES—			
Cotton, manufactures—			
Piece-goods—			
Grey (unbleached)	10,078	.....	24,555
White (bleached)	5,95,421	10,65,485	66,347
Coloured, printed, or dyed	5,54,578	5,60,610	2,97,391
Other sorts	70,24,382	13,45,265	1,29,267
Total	81,84,459	29,71,360	5,17,560
Wool manufactures—			
Hosiery	9,05,727	23,20,345	.....
Piece-goods	3,42,98,353	45,54,966	3,58,636
Other sorts	11,52,401	20,234	1,23,843
Total	3,63,56,481	68,95,545	4,82,479
ALL OTHER ARTICLES	5,29,74,467	1,31,13,403	1,31,06,512

In connection with the purchase of Government stores, the proposed new purchase rules are of interest. The following article from the *Board of Trade Journal* (June 30, 1921) summarizes the situation:—

“PROPOSED NEW PURCHASE RULES FOR GOVERNMENT STORES

“The preamble to the proposed new rules lays down explicitly that it is the policy of the Government of India to make their purchases of stores for the public service in such a way as to encourage the industries of the country so far as is consistent with economy and efficiency. The first rule runs as follows: ‘All articles which are produced in India in the form of raw material or are manufactured in India from materials produced in India should, in preference to articles not manufactured in India or wholly or partly manufactured in India from imported materials, be purchased locally provided that the quality is sufficiently good for the purpose and the price not unfavourable.’

“It is pointed out in the explanation to the rules that the expression ‘not unfavourable’ calls for a comparison of prices but does not prevent the purchase of indigenous stores at a negligible excess cost. It also permits other factors of economy, such as promptitude in delivery, to be taken into account. In the letter to the local governments, the Government of India discuss the question of paying prices higher than the market price for a locally-made article and rule against this method of encouraging indigenous manufacture. They also do not favour the grant of special bounties. The Government of India feel that the question of the encouragement of local industries by either of these methods is fraught with serious difficulties and dangers and should not in any case be undertaken without the most careful consideration.

Articles Manufactured in India from Imported Material

“The second rule relates to articles wholly or partly manufactured in India from imported materials, and runs as follows: ‘All articles wholly or partly manufactured in India from imported materials should, in preference to articles not manufactured in India, be purchased in India subject to the following conditions:—

‘(a) That a substantial part of the process of manufacture of the articles purchased has been performed in India.

‘(b) That the price is as low as that at which articles of similar quality can be obtained from the Stores Department, London.

‘(c) That the materials employed are subjected to such inspection and tests as may be prescribed by the Government of India.

“It is pointed out that condition (b) above, which deals with manufacture from imported materials, is less favourable to the Indian manufacture than Rule 1, which relates to partly indigenous manufactures. This condition (b) postulates a stricter comparison of price than Rule 1.

Articles Not Manufactured in India

“Rule 3 proposes that articles which are not manufactured in India should be obtained by indent upon the Store Department, London, except in the following cases:—

‘(a) When the articles are already in India at the time of order or are already on their way out, and their price and quality are not unfavourable as compared with those at which similar articles could be obtained through the Store Department, London, and the cost of the supply does not exceed the limits prescribed in Rule 2. When the total value of the articles required is trifling it is generally desirable to purchase them locally.

‘(b) In the case of important construction works let out on contract, articles not manufactured in India required for the construction of such works may be supplied by the contracting firm subject to the following conditions:—

- ‘(1) That the firm is approved by the Government of India and is included in the list of firms so approved.
- ‘(2) That the materials are subject to the current specifications and tests prescribed by the Government of India.

‘(c) Plant and machinery and component parts thereof may be purchased from branches* established in India of British manufacturing firms borne on the list of the Store Department of London, and approved by the Chief Controller of Stores, India, provided that the following conditions are observed:—

- ‘(1) That the purchase is made by the Chief Controller of Stores, India, or by a highly qualified engineer directly responsible to the Government of India for the order so placed.
- ‘(2) That the plant and machinery are of standard patterns such as are ordinarily manufactured by the firm; and have actually been so manufactured.
- ‘(3) That the branch firm entertains a staff of expert mechanics capable when so required of erecting and repairing the plant and machinery which it supplies.
- ‘(4) That the actual price of the articles (exclusive of any expenditure representing cost of erection) is as low as that at which articles of the same make can be supplied by the Store Department, London.
- ‘(5) That the cost of supply under any one order or detailed estimate, in respect of any one type of standard plant or machinery, does not exceed 50,000 rupees.
- ‘(6) That when test or inspection of the plant or machinery during manufacture or before shipment is necessary or desirable arrangements should be made for such test and inspection to be carried out by the Store Department, London.

“In the draft rules prepared by the Government of India in 1907 the purchase in India of imported stores was made the rule to which certain exceptions were permitted. The proposed new rule makes the purchase of such stores through the London Store Department the rule and local purchase the exception. In the opinion of the Government of India it is safer to maintain for the present the general prescription in favour of purchases from the London Stores Office and to increase the number of exceptions as experience is gained.”

NOTE.—While this report was in the press, advices were received that the Indian Legislative Assembly had passed a resolution recommending the Government of India to instruct the High Commissioner in London to purchase stores in the cheapest market consistent with the requisite quality being obtained.

* Branches may be held to cover approved technical agents of British manufacturers who do not merely act as selling agents, but who are also in a position to render the same kind of technical assistance in India as actual branches of the firms.

CHAPTER XVIII

The Import Tariff *

The import tariff of British India is very simple in form, consisting of one schedule of duties. There is no preferential tariff on imports and no conventional rates in favour of goods of any particular origin. The prevailing rate of duty on goods imported into India is 11 per cent *ad valorem*. On a considerable number of articles, there is a fixed tariff valuation on which the 11 per cent rate and other percentage duties are levied, so that the cost price of goods is not always the basis for *ad valorem* duties. The 11 per cent rate applies to a large class of goods specified in the tariff and to all articles not otherwise dutiable or exempt from duty. For a long time previous to 1916, the corresponding duties in the Indian tariff were only 5 per cent *ad valorem*. On account of conditions created by the war, the general *ad valorem* rate was, in 1916, raised to 7½ per cent. It remained at 7½ per cent until March 1, 1921, when the present rate of 11 per cent came into effect. The reason given for this second increase in the tariff was the need for more revenue.

Goods subject to 20 per cent *ad valorem* include: confectionery, clocks and watches, electro-plated ware, manufactures of gold and silver, musical instruments, silks and embroideries, cinematograph films, fireworks, jewellery, pictures, smokers' requisites (excluding tobacco), toys, games, playing cards, motor cars, motor cycles, bicycles, parts and accessories of motor cars, motor cycles or bicycles, pneumatic rubber tires and tubes. Before March, 1921, these goods were nearly all dutiable at 7½ per cent.

The duty on sugar was raised on March 1 from 10 to 15 per cent on a fixed valuation; and matches, which were formerly subject to the general *ad valorem* rate of 7½ per cent, were made dutiable at 12 annas (about 22 cents) per gross of boxes containing not more than 100 matches per box. Salted fish is dutiable at a rate to be fixed from time to time but not to exceed 12 annas per maund of 82½ pounds. There are also special rates on spirits, wines, salt, tobacco, petroleum, naphtha, gasoline, etc., coal, arms and ammunition, and opium.

Several kinds of machinery, railway material, and a large class of iron and steel products, including beams, joists, bridge work, etc., for building purposes, nails, bolts, nuts, washers, fencing wire and wire rope, are admitted at the comparatively low rate of 2½ per cent *ad valorem*. Machinery and stores for cotton mills, formerly free, are dutiable at 2½ per cent under the recently revised tariff.

The free list includes practically all kinds of agricultural implements, such as ploughs, harrows, cultivators, seed-drills, rakes, mowing and reaping machines, binding machines, and component parts of any of these articles. Other important items on the free list are cream separators, churns and some other dairy appliances, hides and skins, hops, raw wool, wood pulp, cotton yarn and thread, fertilizers, printed books, manufactured mica, living animals, metallic ores of all sorts, also water lifts, sugar mills, oil presses, and parts thereof, worked by manual or animal power.

IMPERIAL PREFERENCE DISCUSSED

While the present import tariff of India has no differential duties in favour of Empire products, the subject of British preferential duties in India has received a good deal of attention. The increase in the tariff made in March, 1921, as above referred to, led to a question in the British House of Commons as to whether any steps had been taken or would likely be taken by which Empire goods would receive preferen-

* Any tariff summary must omit detail which may be of importance in respect of some articles and it must be remembered also that tariff changes and new rulings are liable to be made from time to time.

tial treatment in India. Answering this question, the Right Honourable E. S. Montagu, Secretary of State for India, on March 2 last said:—

“An announcement has with my approval been made in India that a commission will be appointed to examine, with reference to all the interests concerned, into the future fiscal policy of the Government of India, including the desirability of adopting the principle of Imperial preference. The House will realize that no decision regarding Imperial preference can be taken until the commission reports.”*

Already there is a preferential duty in favour of Britain and British possessions in India's export tariff in respect of raw hides and skins. The ordinary export duty is 15 per cent *ad valorem*. A rebate of two-thirds of this duty is allowed when the hides or skins are exported to destinations within the Empire on guarantee of payment of the remainder of the duty in the event of failure to produce a certificate showing that the hides or skins in question had been delivered to a tanner within the Empire.

INDIAN MERCHANDISE MARKS ACT

Exporters of goods to British India must give some attention to the law and regulations of that country relating to “trade description,” or the marking of merchandise. An examination of the Indian Merchandise Marks Act shows that it is intended chiefly to prevent the labelling or branding of goods in a way that might be regarded as false or misleading. The definition of “trade description” confines the term to a representation or a statement regarding the goods and does not include “make-up.” The “make-up” of goods, therefore, does not in itself amount to a trade description. Pictorial indications, however, might be held to suggest origin. The Act has a further requirement as to stamping the lengths on fabrics usually sold by the yard or by the piece. Outside this latter provision, it is stated that, as a general rule, the Indian Merchandise Marks law is not violated if goods are imported which have no marks of any kind.

In the manual issued by the Government of India to explain the Merchandise Marks law and regulations, goods affected by the Act are classified as follows:—

- (a) Goods having applied to them counterfeit trade marks or other indications that they are the manufacture or merchandise of a person whose manufacture or merchandise they are not.
- (b) Goods having applied to them false trade descriptions or other indications in respect of the country in which they were made or produced.
- (c) Goods having applied to them trade descriptions that are false also in other respects.
- (d) Piece-goods which have not the lengths properly stamped on each piece.

The importation of all such goods is prohibited.

The complete text of the Indian Merchandise Marks Act and instructions relative thereto would fill a large pamphlet. In this article an effort is made to sketch the essential features of the law and the information given does not, of course, fully explain every detail of the Act.

It is most important that imported goods bear no mark or brand that would give a wrong impression as to their origin. If the goods are marked in a way to even suggest a country of origin, that marking must not be deceptive. In order to correct any false idea that might be conveyed by certain trade descriptions of goods, the device known as “counter indication” is sometimes permitted. A counter indication is designed to correct any wrong inference that might be drawn from the otherwise misleading marking. Thus, goods described as “Egyptian cigarettes” exported from Canada should have a counter indication, such as “Made in Canada,” to show clearly that there was no intention to pass off the goods as the product of Egypt. A label bearing even the name of a city or other place in a country which did not actually produce the goods might be held to be deceptive as to the origin of goods and a counter

* The commission has since been appointed.

indication would be necessary. If the name retains its geographical significance, like in "Jamaica rum" or "Manchester shirting," and the goods are not actually made or produced in the country referred to, such marking cannot be made acceptable even by a counter indication. The use on goods of the name or trade mark of any person in the United Kingdom or British India, when such goods are of other origin, calls for a very definite accompanying indication as to where the goods were made or produced. The actual country of origin in that case must be indicated as conspicuously as any name in the trade mark in question. In these cases such marks as "made abroad" would not suffice; the actual name of the country, for example, "made in Canada," must appear.

The language employed in marking is in itself held to suggest country of origin. The case of scents made in Japan and labelled *parfumerie* has been given as an example where counter indication would be required in order to negative any idea that France was the country of origin of the goods. In this connection, English is held to be the appropriate language to be used, under the Indian Merchandise Marks Act, on goods made or produced in the United Kingdom or British possessions. Consequently English words may be employed on Canadian-made goods without a counter indication. On the contrary, a counter indication is necessary where English is used in the marking of goods made in the United States. Firms exporting American goods to India are therefore required, under some circumstances, to mark them "made in the United States" when similar goods, if Canadian-made, might be sent from Canada without being marked "made in Canada." It should be remembered, of course, that the additional words "made in Canada" are not objectionable and this advertisement of the origin of the goods might often advance Canadian interests although not a requirement of the country importing the goods.

Trade descriptions must also be correct as to number, quantity, or weight of goods, component material, mode of manufacture, time of making or producing, existing patents, privileges or copyright, whenever reference is made to any of these things in the marking or labelling of goods.

Regulations Applicable to Commercial Travellers in India

The following is part of an official memorandum regarding regulations applicable to commercial travellers in India:—

SPECIAL REGULATIONS

1. No special regulations exist in British India or Indian states affecting British commercial travellers.

Foreigners, other than officials, are prohibited from entering the State of Jammu and Kashmir, and the Baghelkhand State without a pass from the political offices or the Durbar. These passes are, however, given freely to respectable persons. In the Sirohi State, all travellers have to take a guide with them for the protection of life and property.

LICENSES

2. (a) Except in the case of certain articles such as arms, ammunition, liquors and opium, the sale of which is regulated by special laws, commercial travellers are not required by the central or provincial authorities in British India to take out licenses to carry on their calling or for selling their samples or goods.

(b) No municipal authorities in British India require commercial travellers to take out licenses to carry on their calling, or (except in Calcutta) for the sale of their samples or goods. In Calcutta, commercial travellers who sell precious stones have to take out licenses as "dealers in precious stones," and the fee charged for such a license is Rs. 25.

(c) Commercial travellers are not required to take out any licenses to carry on their calling or for selling their goods in any Indian state except Marwar, where a license must be obtained for the importation of the following articles:—

1. Opium, ganja, charas.
2. Firearms, ordnance, ammunition.
3. Foreign liquors.
4. Mauritius sugar.
5. Sulphur.

(d) Commercial travellers are not ordinarily required to produce certificates or powers-of-attorney authorizing them to act on behalf of the firms they represent.

TAXES (OTHER THAN OCTROI)

3. (a) No income tax or charge of a like nature is levied on commercial travellers by the central or provincial authorities on sales made in British India, nor are resident agents of British firms, as such, liable to any license fee or tax, but they are, like other residents, liable in the ordinary course to income tax and to the usual municipal taxes (e.g., house-rate, water-rate, carriage, dog or horse taxes, etc.) levied in different towns.

(b) Commercial travellers are not required to pay the regular municipal license tax on selling their goods in British India. In the Madras Presidency, however, they are liable to pay profession tax if they exercise their calling within a municipality for a period of sixty days reckoned consecutively or from time to time in a half year.

(c) In the Mysore state itinerant traders are subject to Mahatarfa taxation. In Baroda commercial travellers are required to pay income tax. In the other Indian states they are not subject to income tax or any other charge of a similar nature.

COMMERCIAL TRAVELLERS AND RAILWAY CHARGES

4. (a) No concession in fares is allowed to commercial travellers on any Indian railway.

(b) On practically all Indian railways, luggage, including packages of samples, not for sale, of commercial travellers representing recognized trades or firms, is booked at half parcels-rates under the following conditions, no free allowance being given:—

- (i) The luggage will be carried at owner's risk and the railway shall be held free from all liability for delay to the luggage or samples.
- (ii) The quantity which may accompany owners when travelling by mail train under this concession is limited to five maunds, i.e., 410 pounds, and bulky articles may be excluded from mail trains at the option of the railway administration.
- (iii) Any further quantity booked under the same concession may be despatched by any passenger train other than mail train starting within forty-eight hours either before or after the starting time of the mail train by which the owner travels.
- (iv) Charges will be calculated on the gross weight of the total number of packages.
- (v) If any quantity in excess of five maunds (i.e., 410 pounds) is carried by mail train, it must be treated as outside the concession and charged for at full parcels rates, no free allowance being given.
- (vi) The concession order will be issued by the traffic manager or other authorized officer of the starting station and will apply in through booking, and by stages if so desired, via the route specified to station of destination. The period of availability of the concession order is limited to four months or less.

(c) With the exception of some Light and Hill railways the full parcels rates chargeable on Indian railways are generally calculated on the following basis:—

Distance in Miles.	Weight.									
	Not exceeding 10 seers*.		Exceeding 10 but not exceeding 20 seers.		Exceeding 20 but not exceeding 30 seers.		Exceeding 30 but not exceeding 40 seers.		Additional charge for fractions in excess of even maunds.	
	Rs.	A.	Rs.	A.	Rs.	A.	Rs.	A.	Rs.	A.
Not exceeding..... 25.....	0	4	0	4	0	4	0	4	0	4
Exceeding 25 but not exceeding 50.....	0	4	0	4	0	8	0	8	0	12
" 50 " 75.....	0	4	0	8	0	12	0	12	1	0
" 75 " 100.....	0	4	0	8	0	12	1	0	1	4
" 100 " 125.....	0	8	0	12	1	0	1	4	1	12
" 125 " 150.....	0	8	0	12	1	0	1	8	2	0
" 150 " 175.....	0	8	1	0	1	4	1	12	3	0
" 175 " 300.....	0	8	1	0	1	8	2	2	4	4
" 300 " 325.....	0	12	1	4	1	12	2	2	2	8
" 325 " 350.....	0	12	1	4	2	0	2	2	2	12
" 350 " 375.....	0	12	1	8	2	4	2	4	3	0
" 375 " 450.....	0	12	1	8	2	4	2	4	3	4
" 450 " 475.....	1	0	1	12	2	8	3	8	3	8
" 475 " 500.....	1	0	1	12	2	12	3	12	3	12
" 500 " 525.....	1	0	2	0	3	0	3	0	3	0
" 525 " 600.....	1	0	2	0	3	0	3	0	4	4
" 600 " 625.....	1	4	2	4	3	4	4	4	4	4
" 625 " 650.....	1	4	2	4	3	8	4	8	4	8
" 650 " 675.....	1	4	2	8	3	12	4	12	5	12
" 675 " 750.....	1	4	2	8	3	12	5	12	5	12
" 750 " 775.....	1	6	2	12	4	0	5	5	4	4
" 775 " 900.....	1	6	2	12	4	2	5	5	8	8
" 900 " 925.....	1	9	3	0	4	6	5	12	5	12
" 925 " 950.....	1	9	3	0	4	10	6	0	6	4
" 950 " 1,050.....	1	9	3	2	4	12	6	6	6	8
" 1,050 " 1,075.....	1	12	3	6	5	0	6	6	6	8
" 1,075 " 1,100.....	1	12	3	6	5	4	6	6	12	12
" 1,100 " 1,125.....	1	12	3	8	5	6	7	7	0	2
" 1,125 " 1,200.....	1	12	3	8	5	6	7	7	6	6
" 1,200 " 1,225.....	2	0	3	12	5	10	7	7	7	10
" 1,225 " 1,250.....	2	0	3	12	5	14	7	7	8	0
" 1,250 " 1,400.....	2	4	4	8	6	0	8	8	8	0
" 1,400 " 1,550.....	2	8	4	12	6	8	8	8	8	8
Over...1,550.....	2	12	5	0	7	0	9	9	9	0

* maund (82 $\frac{1}{7}$ lbs.) = 40 seers.

The amounts entered in respective columns.

(d) The North-Western, the Oudh and Rohilkhand and the East Indian Railways grant a rebate on goods including parcel traffic carried by passenger train exported to Persia, if despatched by the Nushki-Seistan trade route, and also on goods coming from Persia by that route and booked to Karachi or to the Punjab or the United Provinces. A similar concession is allowed as regards goods and parcel traffic to and from Afghanistan via Nushki.

CUSTOMS AND OCTROI DUTIES

5. (a) There are no special customs regulations in British India for the treatment of samples of merchandise, and (b) samples having a commercial value, whether brought by commercial travellers or subsequently imported by them, are liable to import duty at the rates specified in the tariff. If the goods have no commercial value, they are admitted free of duty.

(b) Except under a reciprocal arrangement with the United Kingdom and which does not apply to Canada, duty cannot be deposited or guaranteed with a view to the ultimate re-exportation of the goods, but a drawback of seven-eighths of the duty paid on all articles imported is granted on exportation within two years from the date of importation if exported from the original port of import and three years if exported from any other port provided that the goods are identified to the satisfaction of the officer in charge of the customs house at the port of final exportation. It is not necessary that the goods should be exported from the port at which they were imported, and the limit of two years prescribed for re-exportation from the original port of import may be extended by the chief customs authority on sufficient cause being shown in particular cases. Under the orders of the Government of India, the

provisions of section 50 (a)* of the Sea Customs Act are also waived in favour of articles exported with owners as personal baggage.

RE-IMPORTED SAMPLES

(c) Re-imported commercial samples not intended for sale are admitted into British India free of duty subject to the following regulations:—

(I) Samples of goods not intended for sale, reimported by commercial travellers into British India shall be passed free of duty, provided that the Collector of Customs at the port of re-importation is satisfied:

- (i) that duty was paid on first import;
- (ii) of the identity of the articles;
- (iii) that no drawback was paid on export;
- (iv) that the ownership in the articles has not changed since their first import;
- (v) that no more than six months have passed since the articles were exported.

II. The grant of this concession is subject to the observance of the following procedure:—

(1) When the samples are first imported into British India the commercial traveller should produce before the collector of customs a certificate or letter of identity from his principal, or otherwise satisfy the collector of his eligibility for the concession. An invoice in duplicate showing each article in detail should be filed at the customs house. The original will be retained by the customs authorities. Each page of the duplicate will be stamped with the custom house seal, and will be endorsed over the signature of a customs officer, with a reference to the bill of entry on which the samples were assessed to duty. It will be returned together with a certified copy of the bill of entry to the traveller.

(2) The certified copy of the bill of entry must, on each occasion on which the samples are exported from a port in British India to a foreign port, be produced to the customs collector of the port of export, who will endorse, after such examination of the samples as he may think necessary, the copy of the bill of entry with a certificate that no drawback had been paid, together with the date of exportation. On re-importation from a foreign port the bill of entry must similarly be produced to the collector of customs, who will endorse, after such examination of the samples as he may think necessary, the date of reimportation on the bill of entry.

III. When the samples are finally exported under claim of drawback a certificate of examination shall be recorded on the certified copy of the bill of entry by a customs officer after verification of necessary particulars in regard to the identification of the articles and payment of duty. The certified copy of the bill of entry and the duplicate copy of the invoice shall be forwarded to the port of first importation.

(d) Catalogues and advertising circulars are allowed free entry when imported into British India by post, and also when imported by commercial travellers in reasonable quantities along with their personal luggage. In other cases duty is charged on them at 11 per cent ad valorem.

(e) To suit the convenience of travellers entering India via Dhanushkodi samples brought by them are allowed to be sent to Madras under seal, to be dealt with in the latter place. Similarly commercial samples exported via Dhanushkodi are examined at Madras and sent under seal to Dhanushkodi for shipment.

CUSTOMS DUTY IN INDIAN STATES

(f) In most Indian States, customs duty is levied on the value of the goods actually sold, and a deposit is taken for samples imported which is returned if the

* This provides that no drawbacks shall be allowed on exported goods which are not included in the manifest.

goods are not sold. In the case of Indore, Malwa, Jaipur, Kotah, and Jhalawar, a refund is granted at the same post, provided the goods are exported within seven days in the case of Indore, eight to ten days in the case of Malwa, such time as may be fixed in the case of Jaipur, four months in the case of Kotah and one month in the case of Jhalawar. In Kotah the period of four months may be extended on application if sufficient cause is shown. In Bikaner, the Western Rajputana States and Hyderabad refunds are granted if the goods are exported within fifteen days or three or six months, respectively, of the date of import. The goods may be exported from any place within the States and by any route—whether by rail or road. In Kashmir State an amount up to seventh-eighths of duty paid is refunded on re-export (made within two years of import) in the event of satisfactory identification of the goods concerned, provided the amount to be paid is not less than Rs. 5 in each case and claim to drawback is made at the time of re-export; but it is not necessary to export the goods by the post at which they entered the State. In case of such goods imported by post or railway parcel or as personal luggage as are re-exported within a month of their import, the inspector of customs and excise, if the duty on the goods does not exceed Rs. 5 the superintendent customs and excise of the duty does not exceed Rs. 100 and the revenue minister in all other cases may exempt the import from duty providing that the opening of the parcel at the time of the import and the re-packing of it on re-export are effected in the presence of the inspector of customs and excise or in case of his absence from headquarters of a deputy inspector. Provided also that if any portion of the goods imported is consumed within the state, no exemption or re-export shall be permitted unless and until the duty due on the portion consumed has been paid in full. No duty is charged on goods passing through Kashmir on their way to Central Asia. In Baroda, samples brought by commercial travellers, whether of commercial value or not, are subject to customs duty according to the rates in force in the state. But arrangements exist whereby duty may be deposited and a rebate obtained, provided the goods are re-exported from the same place within three months of entrance and in the same condition. In Karauli, a passport entitling a commercial traveller to free passage for his goods is issued free of charge and this pass is valid for 15 days; but duty is charged on the expiry of this period. In Baaratpur a similar passport is issued, which remains valid for one week, but this period may be extended to one month. In Bundelkhand, commercial travellers' samples are exempt from export and import dues. A commercial traveller is required to furnish the Durbars Customs Department with a list of articles brought by him into the Rewa State, with their prices, and this is used to check his baggage on his departure. No deposit need be made or guarantee given (though it will not be refused if offered) for goods imported into this state. If, however, a deposit be made, the amount will be refunded on re-exportation. In Gwalior no duty is charged on samples of no commercial value brought by commercial travellers, and such samples as are unsaleable are allowed free, but all articles which can be sold separately are registered at the customs outposts and import duty at the tariff rate has to be paid on them. A refund of the duty paid is, however, allowed on articles subsequently re-exported from the state, provided that the goods are satisfactorily identified, that the re-export be made within such time as the Gwalior Government may direct, that the goods are entered in the bill of export and that their value is not less than the amount of refund claimed, and that the claim for refund on any single export does not amount to less than rupees two.

REFUND OF OCTROI DUTIES

(g) In towns, municipalities and cantonments which levy octroi samples of a taxable nature are subject to that tax, but the importer is entitled to a refund on exportation except in Delhi City and the Municipal District of Ahmedabad, where an infinitesimal terminal tax is levied upon samples, of which a refund is not given on export. Samples declared as such are not, however, liable to any tax in the Beawar

municipality. In Quetta (the only place in Baluchistan usually visited by commercial travellers) the following arrangement is in force:—

On arrival a list of the articles is taken at the octroi office and a sufficient sum is deposited by the importer to cover the payment of the octroi duty. When the importer wishes to export his goods, the unsold articles are again produced at the octroi office and, on the list of transactions being compared with the original list, octroi is recovered on the articles sold and the balance of the deposit is returned to the importer if the exportation takes place within three months from the date of import.

CHAPTER XIX

Representation

The question of representation is of the very greatest importance, as the success in foreign fields of a manufacturer depends very largely upon its solution, and should thus be given the closest attention.

In the first place it may be stated—and this should be carefully marked by exporters—that the best man they can send out is a Canadian. Without in any way reflecting upon American commercial travellers, it is a mistake for Canadian houses to employ them as representatives in the Middle or Far East. The best hope of doing business lies with big British houses, not only in India, Malaya, and the Netherlands East Indies, but also in China and Japan. And part of the hope rests on Imperial sentiment. But any advantage which may accrue from this might be lost if other than a British subject be sent as a representative.

The following, taken from the *Handbook for Export to South America*, compiled by the writer and published in 1915, is included below. Although the remarks are some years old, they apply equally as much to India to-day as to South America a few years ago:—

PRELIMINARY CONSIDERATIONS NECESSARY

“Before examining the various kinds of representation in detail, it might be as well to consider the subject in a general way. There may be taken, therefore, the case of a manufacturer who, from necessity, or owing to energy and enterprise, or a combination of both, seeks a wider market for the product of his factory. Having ascertained that in certain parts of the world there is a demand for his product, and also that he is able as regards price and quality to compete with concerns already established, the next step is to find a suitable selling agency. And it is in this initial stage that many manufacturers fail, sometimes from sheer indolence, but probably more frequently from inexperience, coupled with a disinclination to seek or take advice. These remarks apply equally to manufacturers in Canada, the United Kingdom, and the United States.

“Having ascertained that his product can compete in the country or countries under consideration—it being assumed that the trade is an important one—and that a fair share of it would make a welcome addition to his business, the manufacturer has then to determine how far he is prepared to go to secure it. At this point much will depend on whether he is diffident, and lacks faith in himself and his product, or whether he is full of determination, energy, and courage. If the former, his attempt will be tentative, and every one will know that it is so, and accordingly will give it scant attention; but if the latter, importers will soon realize that a new competitor has come into the field whom they cannot afford to neglect. The difference between the two will be seen in the manner in which they set about preparing for the new venture, and securing agents. The diffident man looking only to the present will probably demand as a preliminary to any dealings that his goods be paid for by cash

against documents, thereby greatly restricting himself in his choice of a representative. The other, whilst no less desiring safety in his business transactions, will before committing himself, first inquire as to how such a cash basis will affect his efforts for ample and permanent future success, and whether security cannot be obtained without fettering unduly the scope of his energy. It is taken for granted that neither are without sufficient resources to enable them to undertake the venture, or at least that they possess substantial bank credit. As the hesitating, timorous man usually drops out sooner or later, it is unnecessary to consider further his case; the aim will be to assist in his choice the man who has plenty of grit and ability, and who is prepared to adopt as vigorous and aggressive measures as his means will permit.

THOROUGH KNOWLEDGE OF THE FIELD

"Whilst it may not be absolutely essential, still whenever possible a prospective foreign field should be visited by a member of the firm, as first-hand knowledge is invaluable, and it enables the traveller to ascertain the best means for placing his product upon the market. If he uses his time to the best advantage, he can secure a considerable amount of information that will be invaluable to him in his future dealings. If such a trip be not feasible, however, he should endeavour by every available means to obtain all the data possible, to guide him in his future conduct. If there is a Trade Commissioner in the country, his services should be enlisted, and any reports of his published in the *Weekly Bulletin* should be carefully studied. Information can also be gained from consular reports. An idea of the history of the country should be obtained, and a good knowledge also of its geography, and the trade routes that afford communication with it. It is not usually difficult to find some person who has a fairly intimate acquaintance with practically any country on which data is required, but unless the informant is known to be perfectly reliable, every opportunity should be taken to compare his statements with those of others. There is nothing fanciful in the advice given above; it is intended for those who desire to compete in overseas trade, and who are prepared to spare no effort in order to attain success.

AGENTS

"Instead of the manufacturer first seeking an agent, it may be that one or more first seek him, having heard that he has an article which they believe could be handled with advantage to themselves. Such people, as is natural, are usually not unmindful to set before the manufacturer the facilities which they have for selling his product, and if it suits them will usually try to tie him up to a contract for as long a period as possible. This practice is more or less common the world over. Sometimes cash payments are held out as an inducement, and this has a strong influence on many manufacturers; for it can be easily understood that it must be very satisfactory to be paid for goods by cash against documents at port of shipment, as it relieves the manufacturer of much anxiety. But whilst safety should be the first consideration, safety without business is not of much avail; and it is possible that the agents willing to pay in cash might not be the most satisfactory from the manufacturer's point of view. Nothing disparaging is intended against a firm who may in this way seek to obtain an agency; the reason for introducing the subject is to suggest caution in making contracts. It is seldom that there is any great need for haste in such negotiations, for whilst procrastination is to be deprecated, there should always be ample time for making inquiries as to the financial standing of the proposed agents, their foreign connections, and their facilities for selling the particular goods made by the manufacturer. It would be better to break the negotiations off altogether than to conclude a contract without having first made a thorough investigation through impartial sources on the lines indicated above. If the proposed contract did not appear to confer a distinct advantage, an effort should then be made to conduct the investigation by means of cable. It is better to spend money in telegraphing than perhaps to lose one or two years of opportunity.

DIRECT REPRESENTATION

"Where the business warrants it, direct personal representation will usually be found the most satisfactory in every respect. Through its means the manufacturer has the satisfaction of having his business in charge of one whom he knows intimately and trusts, and who has a technical knowledge of the goods he has to sell, and can be expected to be imbued with the enthusiasm of his employers. This representation may take the form of (a) a travelling salesman or (b) a branch office.

"Taking first (a): this largely depends upon whether a salesman is sufficient in himself to secure the business, or whether he needs a resident agent to assist him; and it also depends upon the territory to be covered, the class of importers to be encountered, and whether the house is very firmly established or not. In the last case where a mark is firmly established, importers are inclined to wait until the representative of the manufacturer comes around on his periodical visits. In some instances it may be only necessary for a travelling salesman to make one or two visits, as after that he may find that he can safely leave his business in the hands of a resident agent of some kind of a jobber. No hard and fast rule can be given to govern such cases; the best way to treat them can only be learned by experience.

THE CHOICE OF A SALESMAN

"Before leaving the subject of the salesman, a word as to choice may not be out of place. Too much care cannot be exercised in this regard, as carelessness in choosing, or ignorance of the characteristics which make for success, may prejudicially affect the prospects of the venture. First and foremost, a salesman going to a foreign country should be of exemplary habits. This should be so obvious to any one that it should be unnecessary even to mention it, but strangely this point is often overlooked. Or it may be that a man is sometimes sent abroad, although known to be somewhat unsteady, because he has been found to be successful in securing orders at home. To make such an error as this is fatal. Another matter of importance is that the salesman should possess a modest demeanour. A bumptious man, who will insist on impressing upon present or prospective customers his own and his country's importance, usually succeeds in antagonizing them. Importers in Latin-America have grown very tired of hearing commercial travellers from the United States extolling the superiority of their country, its methods, and its products. It may safely be said that this failing is responsible for the loss of several millions of business every year. A warning may here be given against the excessive use of slang. The travelling salesman should also be neat in his appearance, and of good address.

"From what has been already said, it will probably be gathered that the representative for foreign work must be above the average, and therefore any tendency to choose one because he may be willing to work for a low salary is to be deprecated. A high-priced man, if thoroughly reliable, will save the difference in his salary by the greater care which he will exercise over expenditure, whilst the influence that he can exert on business is incalculable."

One criticism levelled against American salesmen in India is that many of them have undertaken the trip with the idea of seeing the world and making as much money as possible, with no idea of returning to the country. The consequence of this, so it is alleged, is that salesmen very frequently oversell their customers. This is a mistake, and one which it is said is carefully avoided by English representatives. It will invariably be found that travelling salesmen are most successful after they have completed one or two trips, as they then become known to their customers, and a personal relationship is established which is of no less value in India than in other parts of the world.

COST OF A TRIP

It would be very difficult to estimate closely the cost of a trip to India and the countries of the Middle East, as to no little extent this would depend upon the class

of business to be transacted, the length of the trip, the amount of baggage to be carried, and the towns and cities to be visited. It may be said, however, that railway travelling in India is cheap as compared with other countries, and hotels are fairly moderate. In such cities as Calcutta and Bombay hotel accommodation, including meals, costs in the warm weather about 18 rupees per day. Prices are usually raised on the commencement of what is known as the cold weather season.

A word should be said in regard to the season in which to visit India. It would be a great mistake, unless the business was of an urgent nature, to visit India or Ceylon before November, as the hot weather is so extremely exhausting that it is very difficult for a man to keep up sufficient energy to thoroughly carry through his business. The best season is that comprised in the months of December, January, and February; but in regard to this it should be stated that most people aim to arrive in the country during the winter months, and consequently a good deal of congestion must be expected in the hotels.

Travellers should provide themselves with plenty of light clothing, as even in the winter months, except in Calcutta, Karachi, and the central and northern parts of India, the weather is warm all the year round. In the parts mentioned, woollen outer clothing can be worn and an overcoat may be necessary for evening wear or for motoring or driving. Probably the most satisfactory way of obtaining a supply of suitable outer clothing would be to purchase it or have it made on arrival in the country.

SERVANTS

It is usual for travellers to provide themselves with a bearer. A bearer is a personal or body servant which every one in India has who can possibly afford it. To the visitor, particularly if he is likely to be busy and has no surplus energy to spare, a bearer is a very great convenience. But further than this, the bearer acts as a go-between and interpreter for the traveller and performs the many menial services which it is not advisable for the traveller to perform himself. The bearer usually accompanies his master wherever he travels, and this can be done without much expense as third-class rates in India are exceedingly low. It is usual to give him a travelling allowance, which amounts to about twelve annas per day. It is also usual, if it is necessary to visit the hills, to make him an allowance for warm clothing. While he probably uses the same warm clothing over and over, this is one of the customs of the country, and the visitor soon realizes that if he is to have any comfort and peace of mind in India, the more closely he conforms to the ways of the country the happier he is likely to be.

As far as Malaya and the Netherlands East Indies are concerned, it does not matter very much what season of the year they are visited, as the temperature is more or less the same at any time. They are always hot.

SUGGESTION FOR FIRMS IN EXPORT TRADE

An importer in Singapore, criticizing United States business methods, complained in 1920 that the United States were missing a great chance of making friends by neglecting the psychological aspect of business. He stated that not infrequently the B/L arrived a considerable time before the goods. He also complained that sometimes when they sent an order it would not be acknowledged, and a considerable time after, without any advice of any kind, the goods would arrive and in advance of the documents. Of course he was speaking of the latter part of 1919 and the early part of 1920, when business conditions were very different from what they are now, but he favourably contrasted the methods of an English firm of commission merchants, and they are well worth mentioning. He showed the writer a report from this firm which they invariably forwarded each week after the receipt of an order. This report was divided into four columns. In the first column was noted the number of the importer's

indent; in the second column, the date received in England; in the third, the class of goods ordered. The fourth column contained any remarks or explanations such as for instance that the goods were impossible to obtain; or a certain part of the order was being shipped and the balance would go forward by a certain steamer; or that they had shipped part of the order and the balance had arrived just too late for shipment by that steamer but would go forward by the next one; or anything else that might afford information in regard to the goods ordered. The consequence of this policy was that the importer felt that his interests were in safe hands and that they were receiving constant attention, and this was in direct opposition to the feeling of neglect of which he had complained earlier. He further stated that these reports were very useful to show to his customers who might be in urgent need of the goods ordered, as he was able to pass on the feeling of confidence to them and thus retain their goodwill.

PSYCHOLOGY OF TRADE

A firm to be successful in export trade must appreciate to the full that there is a psychology in business just as there is a psychology in most phases of life. It is a mistake to treat all firms alike; they should be considered just as individuals have to be considered, and what is particularly necessary is to study the various ways of obtaining the confidence and the goodwill of foreign customers. Too often, although we know what appeals to us, we do not realize that the same thing appeals to our friends, but one only has to go about the world to realize that the firms who make the big successes in commercial life are those who with a first-class commodity to sell, have not been satisfied with this, but have very closely practised what may be called the subtleties of business life. The remarks in the preceding paragraph about the English firm is one of the best examples discovered so far of putting into practice a knowledge of the psychology of business. Their method described seemed to produce a most extraordinary feeling of confidence on the part of their customers. Instead of a sense of neglect, they had the assurance that a real interest was being taken in their business, and that no matter how busy the firm in England might be, care was taken that orders of their foreign customers should not be overlooked.

CHAPTER XIX

Packing, Documentation and Shipping for Export to India

PACKING

Few manufacturers realize the supreme importance of sending their products to foreign markets packed in such a way that they will arrive in an undamaged state. No hard and fast rules can be laid down, as each article requires its own particular treatment, but a general rule to follow is to aim to send the maximum amount of goods for a minimum amount of shipping charges, with the safety of the contents the first consideration.

Very often instructions in regard to packing are forwarded with initial orders. When such are received it is most essential that they should be carried out to the most minute detail, and manufacturers should welcome them, for they are very often dictated by firms possessing an intimate knowledge of that of which they speak.

If the question of packing be of importance, it is difficult to comprehend the indifference that exporters have demonstrated for the fate of their shipments, when once they have passed from the precincts of the factory. This is regrettable, as it discloses in the shipper a defect of character that will surely reflect itself in the fortunes of the firm.

Packing in Europe has reached a very much higher state of efficiency than in either Canada or the United States. It is much more closely studied on that continent, with the result that each consignment is more often given just the kind of casing that best suits the goods which it contains and the port to which it is destined. It is a waste of material and money to put light goods into heavy cases, and the contrary to this generally entails actual loss.

Packing should receive no less consideration than the making of the goods which it is designed to carry. Factory organization is no stronger than the weakest link of the chain of operations that connects the buying of the raw material with the remittance of the customer.

One of the complaints against North American packing (the term "North American" is employed as the complaint applies equally to Canada and the United States) is that inferior and old cases are sometimes used. There is no reason why this should be so; indeed it is poor economy. Importers demand adequate new casing, and as a rule do not demur to paying for it.

PRECAUTIONARY DETAILS

For machinery special cases should be designed. Large cases containing such goods as threshing machines, motor cars, etc., should be braced in one or more places, and round them a band painted plainly on the outside; and in English, as well as in the language of the country of destination, "chain," "sling," or some such word should be plainly stencilled, also a note to the effect that the sling is to be adjusted at those bands. Failure to do this results in the pinching-in or the smashing of the case when the sling takes the strain.

In many of the ports in India the discharging is done into lighters. At the best, stevedoring is somewhat rough work, and in that part of the world the sling is used freely, often to drag a box from a corner of the hold when it might more properly be done by hand.

Each commodity requires its own particular method of packing, and observation emphasizes the difference between the good and the bad. Some packing indicates that much care, thought and ingenuity have been spent upon it, while another lot will show that stereotyped methods have been followed. It strikes the observer as singular that the good methods are not more quickly discovered and followed by those shippers whose practice is open to improvement.

A MODEL SHIPMENT

One of the best examples of packing observed by the writer was a shipment of calculating machines made some years ago from a factory in the United States to an agent abroad.

Each box was of bright, new wood, splendidly made, and was for practical purposes as intact as the day it left the works. Each case bore the name of the consignee plainly stencilled in black; also the name of the makers. Furthermore, there was securely tacked on to one of the faces a card which bore on its surface a list of the contents. This list, printed legibly, contained the name of each article, even to the literature accompanying the machine. Against each of them was typed, not written, the number of the particular article which the case contained. In its way this shipment was perfect and as simple as it was perfect. There was no need to open the case to ascertain what it contained; a glance at the outside sufficed. In another part of the town and a day or two after, the same cases or similar ones were observed being shipped from the agent's place of business, apparently without having been opened or changed in any way.

INSTRUCTIONS

One thing that interior transportation suggests is the need for care when loose articles such as screws, bolts, nuts, etc., are included in a case. When this is unavoidable, they should be securely wrapped up in canvas and fastened to the article which they accompany, such for example as a part of a machine. The reason for this is that, should the casing become broken, the small parts will not be lost or even separated from the article which they accompany.

One consideration that requires thought is the temperature to which goods will be subjected on the voyage, and the maximum they will stand without deterioration. Certain products should be kept away from the boilers, and if the heat of the tropics is to be encountered, placed in the coolest part of the ship.

The first hazard is climatic, and begins to operate long before the goods reach India, when they pass through the Suez canal and begin their journey through the Red sea. It is here that the terrific heat makes itself keenly felt, the iron sides of the ship sometimes becoming so hot that one cannot touch the plates with one's hands in comfort; and hazards increase the nearer the goods are brought to India. The effect of heavy and continuous rain in the tropics is to produce a dampness in the air quite unknown in North America or Europe, and it is most destructive to many articles. Indeed the moisture and heat combined set up various types of fungoid growth and decay in goods which are quite unaffected by the climatic conditions in such a country as Canada. Mildew attacks books, cutlery, leather, textiles, and stationery. In order to preserve them, constant attention is necessary to cutlery and metal work. Even perishable goods soldered in tin-lined cases are not safe if they have been packed in wet weather. Straw and shaving packings holding a great deal of moisture in damp weather will do considerable damage when sent to the tropics. Therefore, no merchandise that is liable to injury from heat or moisture can be stored long in India without serious deterioration.

CHECKING

A frequent cause of complaint amongst importers is that goods are not sufficiently checked before being placed in their cases, which leads to annoyance and claims on the one hand, and to explanations on the other. The packing department of an exporting concern should be placed in charge of a highly competent, resourceful, and above all reliable man, who can be depended upon to ensure that the contents of every package are checked with the invoice. Not infrequently a saving can be made on shipping charges by enclosing several small packages in one large case, but when this is done care should be taken that one may not damage the other. For example, it would not be advisable to enclose a fragile article with a heavy, solid one, or a greasy one with another one on which grease might have a damaging effect.

Canadian firms should, when the necessary information is forthcoming, classify each port of the world to which they ship or may ship their products. The prepared data should include notes as to the manner of discharging, efficiency of stevedoring, whether open roads, harbours or dockside. With this in hand there could be little difficulty in supplying packing to meet each circumstance.

In some highly organized, progressive factories a practice is made of encouraging employees to suggest improvements. In the export trade this excellent principle might be effectively applied in many ways, and particularly to the subject here under consideration. Employees should be stimulated to study the very best form of packing under varying conditions, for the open roadstead or the enclosed basin, aiming also to secure a maximum of accommodation for a minimum of space. And finally, the results should be submitted to tests as near to the actual conditions as can be imagined. Since nearly every factory has a crane, cases can be pulled about and dropped, just as might happen in discharging from a ship. This idea may be a novel departure, and may even raise a smile, but it is just one of those details that form a link in the chain of success.

THE "HAZARD" MACHINE

In the last few years some American manufacturers have by careful experimentation immensely improved their method of packing. In some instances the experiments have been carried out by means of what is known as the "Hazard" machine, which duplicates in a few minutes the shocks and rough handling to which cases may be subjected in long journeys.

An illustration of a "Hazard" machine is given overleaf. It will be seen that it is very similar in form to a miniature Ferris wheel. On the interior of the wheel shelves are arranged in such a way that a case placed on one of them falls in different positions as the machine revolves. The first installation of this machine was made at the Forest Products Laboratory at Madison, Wis. At the present time there are fourteen in use in the United States, as far as is known, and of these twelve have been installed by manufacturers of boxes to enable them to develop a container best suited for the various commodities shipped by their customers. At the present time no "Hazard" machines have been installed in Canada, but it is sincerely to be hoped that this deficiency may speedily be made good.

The cost of installing this machine comes to about \$4,000. From personal observation it can be said that it is very effective for the work it is designed to perform. United States manufacturers interviewed have testified to the efficiency of the machine, and state that not only has it saved them money but it has also obviated disputes with their customers. One firm which ship a very fragile commodity have reduced their losses in transit to the vanishing point, although formerly these were a very considerable item.

This office is prepared to supply full information in regard to "Hazard" machines, and to advise Canadian manufacturers who have had difficulty in packing for export.

CO-OPERATION OF TECHNICAL SCHOOLS

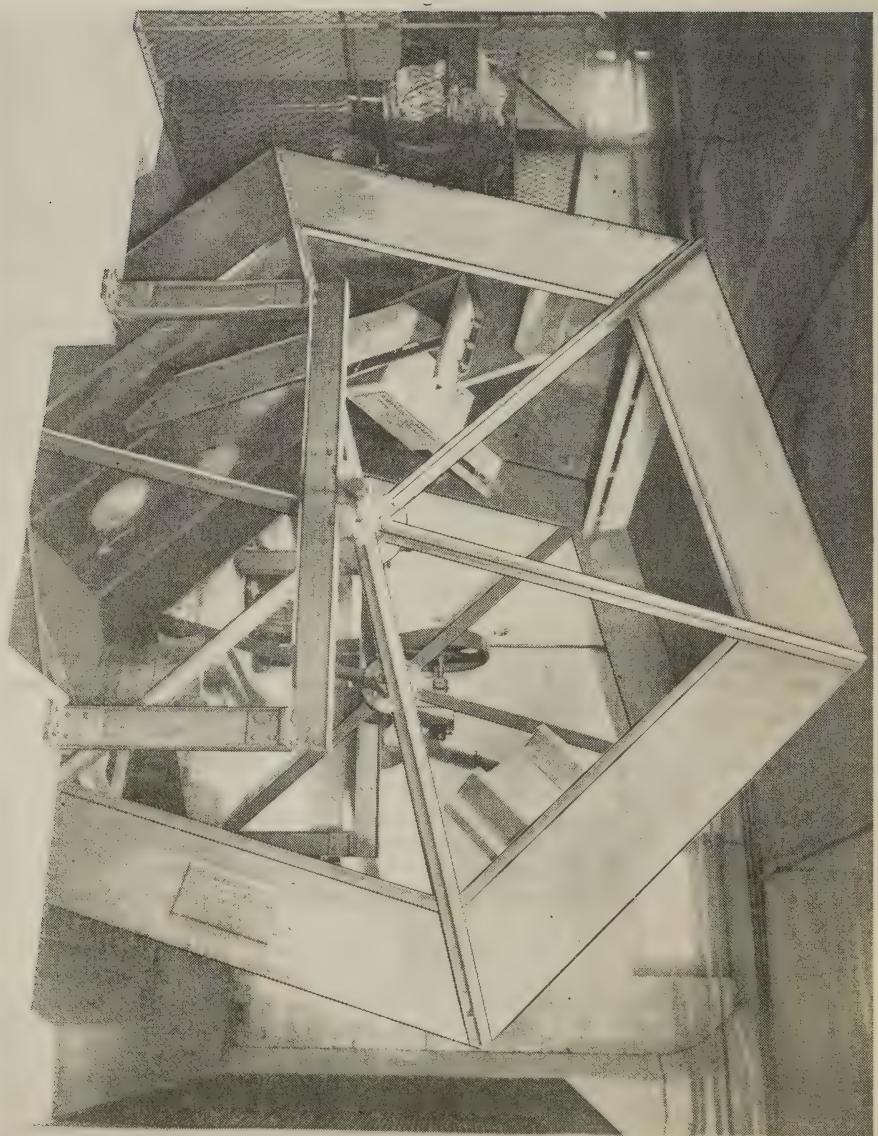
The problem of packing might be studied with great advantage in Canadian technical schools, and could be developed as part of their regular course; hence the question of placing it upon the syllabus of these educational institutions should receive careful consideration. The idea might be further developed, so that these schools, or perhaps one of them in particular, might be of great assistance to manufacturers, through encouraging the latter to submit their packing problems, which could be worked out by the students. Co-ordination of interests for the benefit of the whole did a great deal for German commerce, and it should do the same for that of Canada.

Finally, it may be said that an exporter should never be entirely satisfied with his packing, and should constantly endeavour to improve upon it, either through the ingenuity of himself or his assistants, or by discovering and utilizing the improvements of his competitors.

SHIPPING

Before shipping goods to a foreign customer, great care should be exercised to see that they are absolutely up to specification, and where they are sold by weights, that full measure is given. If this is not done, it leads to claims on the part of the consignees, and very often to friction and sometimes mutual recrimination. On no account should one article or class of article be substituted for another that has been specified. The reasons have to be exceedingly strong to authorize such a procedure as this. Usually it would be much better to delay a shipment or part of it and cable for instructions. Unauthorized substitution is a frequent source of complaint on the part of importers, and often leads to a great deal of annoyance, which in turn imperils business relations.

For small shippers, or even those who are not well versed in the intricacies of shipping abroad, it will usually be most convenient to secure the services of an entirely reliable shipping agent at the port of shipment, who will attend to the despatching of



The "Hazard" Machine.

the goods, preparation of documents, etc. The fees of such an agent are not usually excessive, and in many cases it is money well spent. When shipping to India from Canada, if this method were adopted, it would be necessary to find an agent in Halifax, St. John, or Vancouver. A good man may usually be discovered by making inquiries amongst friends who have had experience of business dealings with foreign countries. Exporters whose shipments are large and continuous will probably find it convenient to have their own office in one of these ports to attend to the many details connected with ocean shipping.

As each shipment entails certain expenses, it is a good plan, where it can be arranged, to combine several under one head, as by doing so this will result in the saving of a number of fees.

It is advisable to follow up shipments with inquiries, to ascertain from the consignees if the goods which they have received have been giving satisfaction, and if not, the reason. Not infrequently shipments are made by manufacturers through commission houses without their knowing the names of the consignees, and while of course the commission houses have a perfect right to withhold the names of their customers, still it will do no harm to make the attempt; and every manufacturer should desire, if only for his own satisfaction, to know the fate of the products of his factory.

MARKING

Whenever possible it is essential that the marking of all packages for export be done with a stencil on two adjacent sides. The marking required is the shipping mark and number. The latter is essential for purposes of identification, as every case should be numbered in such a manner that it will be possible to identify it from the invoice. It is well to stencil on the gross and net weight of each case. The marking of the country of origin on the outside of the packages is not being insisted on by the Indian custom authorities. Tags should be avoided, and, if necessary, metal ones only should be employed. Before shipping all marks should be carefully checked by a responsible clerk.

DOCUMENTS

In the case of shipments where the payment is to be made by the acceptance of a draft, there is usually attached to the latter the invoice, the bill of lading, the insurance policy, and any other documents which the importer demands. If, however, the goods are sent through a shipper, the invoice of the shipper is also required. Neither a consular invoice nor a certificate of origin is necessary, but the original commercial invoice, relating to the goods being imported into India, must be produced, showing the real value, quantity or the description of the goods. The customs officials, to support the authenticity of the invoice, insist upon it being signed; if sent to Calcutta the signature of the exporter is required; if sent to Bombay or Madras the supplier's or manufacturer's signature is sufficient.

In making out the invoices the only particulars required are those which are necessary for ordinary trade purposes. These particulars are used for the compilation of statistics and should include the net weight for metals and hardware generally, the strength as well as the number of quarts or pints for liquor and spirits, and the pieces, width and length in yards, for piece goods.

The above-mentioned documents are made out in two and sometimes three sets. One of the sets comprises negotiable documents, whilst the other two sets are non-negotiable. The former should always be sent to the bank along with the draft on the foreign importer, and the latter two sets to the indenter and *dubash* or agent if he is employed. These latter two sets should be clearly marked "copy."

BILLS OF LADING

As explained above, the proposed documents required in connection with a shipment are a bill of lading, commonly abbreviated to B/L, the shipper's invoice, and

the insurance policy. In R. S. Osborne's *Modern Business Routine* a bill of lading is defined as "A receipt for goods shipped in a vessel and contains the terms and conditions upon which they are to be graded." As a rule five sets of bills of lading are required and possibly six, two to be attached to the negotiable security, one for the files of the exporter, one for the ship, and one for the advice of shipment. Certain ports of the country of destination may also require one.

It is very necessary that an endeavour should be made to obtain "clean" bills of lading as, if it were shown by this document that packages had been handed to the ship in a damaged condition, it might react prejudicially upon the exporter. The bills of lading must show the gross weight in pounds, and should also show the measurement in feet and inches. When shipments are consigned "to order," the bills of lading must show the name and the address of the party to be notified.

FOREIGN INVOICES

The absolute necessity for accuracy in the preparation of foreign invoices cannot be too strongly impressed upon the exporter. Errors and omissions are liable to be severely punished upon the arrival of the goods at the port of destination. In Madras, for instance, if the goods are held up by incorrect invoices and lie in the custom house for more than seven days, heavy demurrage must be paid. This demurrage is reckoned by the day by the Port Trust, and no claims can be made upon the agent of the steamer for shortages.

In the body of the invoice there should be specified the marks and numbers of the various cases and packages as well as the contents of these either singly or in lots and the price of the same. Marks on the invoice should correspond with the marks on the packages, and it is advisable that the latter admit of the instant identification of the contents. This system of identification should never vary, so that without being opened there would never be any doubt as to the contents of each case.

DOCUMENTS TO ACCOMPANY EXPORT SHIPMENTS

It is very important that a set of documents accompany each export shipment. If this is not possible, it is most essential that the documents be despatched by first mail in order that they may be in the hands of the consignee before the goods arrive.

APPENDICES

APPENDIX I

The Jute Mills of Calcutta

The jute mill companies owning mills on the banks of the river Hoogly number forty-eight, with 40,367 looms. There are at present building or under contemplation new mills or extensions to existing mills, which will increase the number of looms to about 50,000.

The Calcutta mills, unlike those in Dundee, have both spinning and weaving machinery; the raw jute goes in at one end and comes out as hessian cloth (burlap) or bags, packed in hydraulically pressed bales, at the other. In Dundee one mill spins the yarn and another weaves the cloth; in some cases a third calenders, sews, and packs the bags.

The majority of the Calcutta mills are steam-driven, but some few concerns have either wholly or entirely electrified their mills. Unfortunately water-power is not available within some hundreds of miles, otherwise the mills, being in more or less close proximity to one another, would offer an unusually favourable field for the employment of a central power scheme. The present annual consumption of coal is over 1,000,000 tons.

RAW JUTE

A certain amount of jute is grown in the vicinity of Calcutta, but the bulk of the crop comes from eastern and northern Bengal. The present consumption of the Calcutta mills is reckoned to be about 6,000,000 bales of 400 pounds each. The jute is grown by Indian cultivators and is purchased from them in the up-country bazars by middlemen, who in turn sell it to balers, from whom the mills purchase their supplies.

The normal out-turn of fibre is about 1,200 to 1,600 pounds per acre per annum. This year's crop is an unusually short one, the Agricultural Department's estimate of yield from all districts being roughly 6,000,000 bales, against a normal crop of 8,000,000 to 9,000,000.

The mills have considerable storage accommodation, and the majority of them are at present carrying heavy stocks of raw material, as they are safeguarding themselves against a possible shortage when Continental Europe is again in the market for supplies. Prior to the war, Austria, Hungary, and Germany purchased considerable quantities of jute for their mills. This supply was of course cut off during the war, and these mills have either been closed down or have been running on such substitutes as textilose. Owing to the lack of credit facilities, the German and Austrian mills are now finding difficulty in purchasing jute, but by degrees they will no doubt again come forward as competitors of the Calcutta mills for the raw material. Had they and other continental countries been in a position to purchase normal quantities this season, there is little question but jute prices would have been on a very high level in view of the short crop. As it is, Calcutta mills practically control the market, and though prices are above normal they are by no means at famine level.

Calcutta mills absorb about two-thirds of a normal crop. After Calcutta, Dundee is the largest buyer, and other important purchasers are Spain, the United States, Brazil, and Italy, in addition to Germany and Austro-Hungary. The Japanese have recently erected several mills in Japan and in the vicinity of Harbin, the latter to manufacture bags for the Manchurian soya bean trade. Calcutta has so far had the monopoly of this business.

With the large extensions in view in Calcutta, and the prospect of the resumption of trade by the Central Powers, there is likely to be keen competition for jute in the future. In the present jute-growing districts the area under cultivation is not capable of much expansion. There are great tracts in Assam which will doubtless in the course of time produce jute, but the difficulty at present is that the country in question is very sparsely populated and what inhabitants there are are not conversant with jute culture. The Government Agricultural Department for some years past has been working at improved strains of jute, and considerable progress has been made. Some of the varieties evolved give heavy yields and are practically blight-proof, and as there is a great demand among the ryots for the seed of these it is hoped by degrees that the yield per acre will show a material advance.

LABOUR AND MANAGEMENT

Out of the forty-eight companies owning mills, only five have a sterling capital, the remainder being Calcutta rupee companies. The mills are managed by firms of managing agents in Calcutta. The European managers and overseers are practically all recruited from Dundee. The Indian labourers employed last year in the Calcutta mills numbered about 272,000. They earn very good wages and are comfortably housed in lines provided by the mills. Water supply, sanitary arrangements, etc., are on up-to-date lines, and large sums have been spent on such objects during the past few years.

RESULTS AND PROSPECTS

During the war practically all the sandbags, and bags of all descriptions for the Allied armies, were manufactured by Calcutta mills. These were all supplied at a contract rate, which sometimes showed a small profit and sometimes a loss to the manufacturers. The fact that so much of their production was required for war purposes enabled the mills, however, to secure very handsome prices for the balance of their production, and they earned large profits. All companies took advantage of these prosperous times to consolidate their financial position, and they are now, with large reserves and block accounts written down to small figures, in a very strong position to meet hard times, should these again come. Replacements of machinery could not, of course, be made during the war, and even now there is great delay in the execution of orders, but on buildings, storage accommodation, sanitation, etc., the mills have spent large sums, and they are now, generally speaking, in exceptionally fine order. It should be noted that only an infinitesimal proportion of the profits was made directly out of the Allied Governments, as their requirements, whatever they happened to be, were met at a low figure; in fact the mills were thanked by the Government at the close of the war for the patriotic attitude they had adopted which had saved the Allies many millions of money.

With the Armistice and the consequent withdrawal of Government orders prices at once fell, and there was a prospect of a considerable period of dull trade, but mills combined to meet the situation and by curtailing production they again imparted a more healthy tone to the trade. Since April 1, 1920, they have again been working full time, and so far consuming centres have taken all the goods the mills have turned out. Profits, while not on the same level as during the war years, are still good, and prospects for the present are satisfactory. Stocks of goods in all countries are low, and as the majority of the mills' customers are becoming accustomed to a higher level of prices, they are showing more confidence in purchasing.

Calcutta with raw jute—which up to date is practically a monopoly of Bengal and the adjoining provinces—at its door and its virtually unlimited supply of cheap labour, would appear to have little to fear from any rivals.

SHIPMENTS

Statements are attached showing the shipments of bags and cloth during 1919 to Calcutta's principal customers.

Disposal of out-turn, 1919 (approximate figures)

Cloth

	Million yards	Million yards	
United Kingdom	104	South America	277
Continent	16	Australia and New Zealand	18
Egypt	3	China and Japan	6
North America (including Canada)	724	India	34

Bags

	Million	Million	
United Kingdom	59	New Zealand	6
Continent	17	Straits	17
Egypt and Levant	17	China and Japan	59
South Africa	23	North America	58
Mauritius	4	South America	28
Burma	46	West Indies	22
Australia	38	India	97

APPENDIX II

Methods of Purchasing and Shipping Jute Products

The following are particulars of the Hessian (burlap) business between Calcutta and Canada.

Descriptions.—Hessians are made in two ranges of weights known as 11 porters (heavies) and 9 porters (lights). The word porter indicates the number of threads in the warp, i.e., 11 porters contain 11 threads to every $3\frac{3}{4}$ inch, and 9 porters 9 threads. The weft is known here as "shot" and unit of measurement in this case one inch. The "count" of Calcutta goods is therefore "so many" porters, "so many" shots.

The standard width of all Hessians is 40 inches.

The standard of 11 porters is 40 inches, $10\frac{1}{2}$ ounces, 11 (porter), 12 (shots), and the weight of any odd width cloth is calculated as on the basis of $10\frac{1}{2}$ ounces for 40-inch cloth. For instance 45 inches 11 porters is known as 45 inches $10\frac{1}{2}$ ounces/40-inch weights of 11 porter range from $9\frac{1}{2}$ to 12 ounces for 40 inches.

The standard of 9 porters is 40 inches 8 ounces 9 x 10 and the weight of any odd width is similarly calculated. Weights of 9 porters range from $7\frac{1}{2}$ to 9 ounces for 40 inches.

With regard to widths other than the standard 40-inch, 36-inch cloth is always readily obtainable and, as a rule, 45-inch can be easily bought. Other widths can only be procured by special arrangement and, as a rule, in lots of not less than 100,000 yards. Some mills can manufacture up to 72 inches, but these wide cloths are rarely taken for the American or Canadian markets.

Goods are packed in iron-bound bales of 2,000 yards.

METHOD OF WORKING

Some firms work through agents in New York and others direct with the large consumers. We ourselves work direct, as we found some years ago that the agent's commission was a handicap. In normal times the business is worked on firm offer

from Calcutta, but since the disorganization in the cable service few firms here have consented to take the risk of the market and offers have mostly had to come from your side. The market is much influenced by speculators and fluctuates considerably.

TERMS OF SALE AND FINANCE

Calcutta goods are never sold on sample, the terms being "fair average weight, width, porter, and shot at time of shipment." Jute being a coarse fibre and labour more or less unskilled, it is impossible to guarantee perfection in every piece of cloth or bag, hence the stipulation of fair average. Where goods are sold c.i.f. or c. & f. bill of lading date is proof of date of shipment. Where buyers purchase f.o.b. and arrange their own freight, sellers ship in accordance with their instructions, and if a steamer, in which freight has been booked, and which is expected to load in, say, October, is not ready until November, the onus is on the buyer.

All quotations are in sterling per 100 yards. Buyers provide letters of credit, under which sellers draw in sterling on a London bank at any usance, up to 4 m/st, convenient to buyers. In American business the usance is generally 4 m/st, in other parts of the world 3 m/st.

FREIGHT, INSURANCE AND EXCHANGE

Unless otherwise arranged, differences in freight are on sellers' account in the case of c.i.f. or c. & f. sales.

Quotations, unless otherwise stated, are c.i.f. Some buyers prefer to do their own insurance; quotations then are of course c. & f.

War risk insurance is always on buyers' account, and is never covered by sellers unless they are expressly requested to do so by buyers. This should be noted.

Fluctuations in exchange are on buyers' account. When making offers or quotations, sellers advise the rate of exchange at which their calculation is made. If, by the time a reply is received here, exchange has risen, the business is "off" and sellers must again communicate with buyers. If exchange remains unchanged or has fallen the business goes through, in the latter event buyers receiving credit in invoice for the gain in exchange. As a rule buyers give standing instructions to sellers to cover exchange as soon as business is fixed (it is possible here to contract forward with the banks to purchase bills), but occasionally buyers prefer to leave exchange open, on their account, to be covered when goods are shipped. A definite understanding on this point is, of course, necessary between buyer and seller. The conservative course to adopt is to cover exchange at time of purchase as, with the present-day severe fluctuations, a buyer cannot even approximately estimate what his goods will cost if exchange is left open.

GENERAL

Late Shipments.—Sellers must at once advise buyers if goods are late, and the latter have the option of cancelling or of accepting without penalty.

Strikes, etc.—Where a mill from which goods have been purchased advises that delivery may be delayed on account of strikes, breakdown of machinery or from any other cause of *force majeure*, sellers must advise buyers, but the latter have no right to cancel unless goods are actually late.

Calcutta mills do not sell direct to overseas buyers; the business is done through merchant houses in that city. Certain of the large buyers in the States grade the mills into three groups (A, B and C), according to the quality of their production. A and B group mills usually command a small premium for their goods.

APPENDIX III

The Tea Trade of India

The tea crop from North India for the past six years has been:—

	Pounds		Pounds
1914..	288,528,386	1917..	341,126,256
1915..	340,446,773	1918..	347,201,007
1916..	340,846,956	1919..	(estimate) 345/350,000,000

The acreage under cultivation in North India for the same period has been:—

	Acres		Acres
1914..	555,725	1917..	584,933
1915..	564,111	1918..	592,732
1916..	573,319	1919..	(estimated) 595,000

In 1913 the principal shipments of Indian tea from North India were as follows:—

	Pounds		Pounds
United Kingdom..	196,352,620	Africa..	2,330,852
Russia..	28,017,858	United States..	1,998,655
Australia..	9,903,212	Persian Gulf..	1,633,820
Canada..	6,047,896		

Russia also purchased considerable quantities in London.

PROPRIETORSHIP

Estates in North India vary in size from properties having 50 or 100 acres under cultivation to large estates with, say, 2,000 acres of tea in bearing, the most usual size of estate being about 600 acres. Of late years Indians have devoted attention to tea, and there is now a fair number of Indian-owned estates, but the great bulk of the capital invested in the tea industry is British. The majority of companies have sterling capital, and are controlled by boards of directors in the United Kingdom, working through agency houses in Calcutta, but there are also a large number of concerns with rupee capital entirely controlled in Calcutta.

SALES

A certain quantity of tea is sold in packets or small chests direct from the estate, but the bulk is sold by public auction, either in London or in Calcutta. In normal times weekly auctions are held in Calcutta from about May to February; in London auctions continue throughout the year.

PROMOTION OF CONSUMPTION

Some fifteen years ago producers agreed to contribute a small cess of a quarter of one pie per pound on all tea shipped wherewith to form a fund to be used to promote consumption of tea. This fund is administered by the Indian Tea Cess Committee in Calcutta, and in 1919 the cess produced about Rs. 4½ lacs (at exchange 2s. equal to, say, £45,000). Powers are at present being sought to increase the cess to a maximum of one pie per pound, although it is probable only half of one pie will be levied for the present or, say, double the amount of the previous cess. For some time after the Cess Committee was formed attention was concentrated on a campaign in the United States, but the results were disappointing, owing principally to the funds at the committee's disposal being inadequate. This branch of the work has now been closed, and the committee's resources have been devoted to work in India with very satisfactory results. Although it is difficult to give figures having any degree of accuracy, there is no doubt the consumption of tea is advancing steadily in this country and that it will continue to increase. The present consumption is probably about 40,000,000 to 50,000,000 pounds per annum.

LABOUR

The indigenous inhabitants of the tea districts only work on the estates in very small numbers, and the bulk of the labour has to be imported from the Central Provinces and other parts of India at great cost to the industry. The labourers are well cared for in every way, and the conditions under which they live are superior to those obtaining in their own villages. European and Indian medical officers, suitable hospitals, good water supply, etc., are all found by the estate free of charge to the labourer. After serving a term on an estate, many of these labourers take up land of their own from the Government for cultivation, and Assam has been largely populated by ex-tea-estate coolies, much to the benefit of the country.

MANUFACTURE

An up-to-date tea factory is conducted on most sanitary and scientific lines by means of expensive machinery imported from England. Drinkers of Indian tea need have no fear that teas turned out in this country have been produced under anything but the most cleanly and sanitary conditions.

ORGANIZATION

The majority of estates belong to the Indian Tea Association, which has branches in London, Calcutta, Assam, and the Surma valley, and to affiliated associations in other tea districts. The Indian Tea Association deals with all matters affecting the industry, and also maintains a scientific department with staff of experts who are at work on problems connected with the tea bush, manufacture, etc.

PRESENT PROSPECTS

With the withdrawal of one of its principal customers (Russia), the industry is finding the supply of tea in excess of the demand and, as a natural corollary, the market for tea is at present in a very depressed state. Fine teas are still selling at remunerative rates, but the bulk of the 1920 crop, according to present indications, will be marketed at prices considerably below production costs. The question of restricting production is at present under serious discussion, and it is not improbable something tangible will result, as Ceylon appears anxious to co-operate in this direction. Stocks of tea in the United Kingdom are much above normal, and until these are worked down to a more reasonable level no improvement in the market is to be expected. A period of considerably prosperity for the industry is anticipated if and when conditions in Russia are such as to enable her once more to become a purchaser of tea.

[NOTE.—Since the above was written the majority of tea concerns have decided to limit production of 1920 to 90 per cent and in season 1921 to 80 per cent of the average production of the five seasons 1915-19.]

APPENDIX IV

The Hides and Skins Trade of India

SALTED COW AND BUFFALO HIDES

(a) *Daccas*.—These hides come from the Bengal and Assam districts cured with "Karee" salt, a special salt practically only available in Bengal. They are available in weights averaging from 3 to 20 pounds in cowhides, and 5 to 60 pounds in buffaloes. Cowhides are sold in four assortments; buffaloes in three.

(b) *Salted Agras*.—Hides from the United and Central Provinces and the Punjab. Average from 5 to 25 pounds in cowhides and from 5 to 40 pounds in buffaloes. Agra cowhides are sold in five assortments, salted buffaloes in three or four. Of the above, the salted Agras are the better hides, but both Dacca and Agras give a very fine grade of cowhide leather.

Marks

BDS	Best Dacca Slaughtered.
MDS	Mixed Dacca Slaughtered.
MDD	Mixed Dacca Dead.
DRD	Dacca Double Rejections.
SACCS	Salted Agra Cow Comst. Slaughtered.
SACS	Salted Agra Cow Slaughtered.
SACD	Salted Agra Cow Dead.
SACR	Salted Agra Cow Rejection.
SACRD	Salted Agra Cow Double Rejection.
DB/F	Dacca Buffalo Firsts.
DB/S	Dacca Buffalo Seconds.
DB/R	Dacca Buffalo Rejections.
SAB/F	Salted Agra Buffalo Firsts.
SAB/S	Salted Agra Buffalo Seconds.
SAB/R	Salted Agra Buffalo Rejections.

ARSENICATED COWHIDES AND BUFFALO HIDES

(a) *Agras*.—These hides come from the Central and United Provinces and the Punjab. The hides are taken straight from the slaughter-house and stretched on wooden frames, fleshed and left in the sun to dry. The districts from which these hides come are sometimes badly pested with insects which eat into the hide. In order to prevent any damage to the hides, they are subjected as soon as possible to an arsenicated bath which effectively kills all vermin and preserves the hide. First-class arsenicated Agra hides are considered to be some of the best hides available and give absolutely a first-class leather. In these cowhides we have two qualities:—

First Quality

AACCS	Arsen. Agra Cow Comst. Slaughtered.
AACS	Arsen. Agra Cow Slaughtered.
AACS No. 2	Arsen. Agra Cow Slaughtered No. 2.
AAACD	Arsen. Agra Cow Dead.
AAACR	Arsen. Agra Cow Rejection.
AACRD	Arsen. Agra Cow Double Rejection.

Second Quality

NWACS	North Western Agra Cow Slaughtered.
NWACD	North Western Agra Cow Dead.
NWACR	North Western Agra Cow Rejection.
NWACRD	North Western Cow Double Rejection.

FURTHER TYPES OF ARSENICATED HIDES

(a) *Purneah*.—These hides are sun-dried but not stretched, and come from the Purneah district. They are very clean in appearance and free from meat, having been well fleshed. In tanning a very fine leather is produced.

(b) *Durbunghas*.—These are the same type of hide as Purneahs, except that they are not so clean and slightly fleshy. The raw hide is not quite so substantial as Purneahs, but tans very well.

(c) and (d) *Plain and Common or Uncrumpled and Crumpled*.—These two classes are taken chiefly from Durbunghas. The plain or uncrumpled is not stretched and is not cured so well as Durbunghas. The common or crumpled hide is usually badly fleshed, and is therefore fleshy and often discoloured.

Marks

PURNEAHS

PACS	Purneah Arsenicated Cow Slaughtered.
PACD	Purneah Arsenicated Cow Dead.
PACR	Purneah Arsenicated Cow Rejections.
PACRD	Purneah Arsenicated Cow Double Rejections.

DURBUNGHAS

DACS	Durbunghas Arsenicated Cow Slaughtered.
DACD	Durbunghas Arsenicated Cow Dead.
DACR	Durbunghas Arsenicated Cow Rejections.
DACRD	Durbunghas Arsenicated Cow Double Rejections.

PLAIN OR UNCRUMPLED

ACS/A	Arsen. Cow Slaughtered, Uncrumpled.
ACD/A	Arsen. Cow Dead, Uncrumpled.
ACR/A	Arsen. Cow Rejections, Uncrumpled.
ACRD/A	Arsen. Cow Double Rejections, Uncrumpled.

COMMON OR CRUMPLED

ACS	Arsenicated Cow Slaughtered.
ACD	Arsenicated Cow Dead.
ACR	Arsenicated Cow Rejections.
ACRD	Arsenicated Cow Double Rejections.

Agra Arsenicated Buffaloes.—The cure and preparation of these hides is exactly the same as Agra cowhides. The buffaloes when tanned produce a very fine leather, which is considerably used for belting and harness, etc.

Marks

AABCs	Arsen. Agra Buffaloes Commst. Slaughtered.
AABS	Arsen. Agra Buffaloes Slaughtered.
AABD	Arsen. Agra Buffaloes Dead.
AABR	Arsen. Agra Buffaloes Rejections.

Durbunghas Buffaloes.—These hides are cured the same as Durbunghas cowhides and are also used for heavier leather articles such as harness and sole leather.

Marks

DABS	Durbungha Arsenicated Buffaloes Slaughtered.
DABD	Durbungha Arsenicated Buffaloes Dead.
DABR	Durbungha Arsenicated Buffaloes Rejections.
DABRD	Durbungha Arsenicated Buffaloes Double Rejections.

Common Buffaloes.—Same type as Durbungha buffaloes, with the exception that they are fleshy and discoloured, and consequently do not come out so well in the tanning.

Marks

ACBS	Arsen. Cured Buffalo Slaughtered.
ACBD	Arsen. Cured Buffalo Dead.
ACBR	Arsen. Cured Buffalo Rejection.
ACBR/R	Arsen. Cured Buffalo Double Rejection.

HIDES AND SKINS BUSINESS BEFORE THE WAR

Most of the hides and skins exported from India before the war found a market in countries outside the British Empire. In the year 1913-14, for which the returns are fairly typical of pre-war conditions in this branch of the trade, the exports of hides and skins, raw and tanned, from India to British countries formed 20 per cent of the whole by weight, and were consigned principally to the United Kingdom (19 per cent). The exports to the United States were 28 per cent, and to all Allied countries 38 per cent, while the exports to Germany were 21 per cent, and to all enemy countries 36 per cent. By value the position of the inter-Empire trade in Indian hides and skins was a little more favourable, the proportion exported to British countries being 27 per cent of the whole (26 per cent to the United Kingdom). This trade by weight and by value has an important significance. It is due to the fact that the exports to British countries comprised nearly all the tanned or dressed hides (98.5 per cent), and the great bulk of the tanned or dressed skins (80 per cent), but only a small portion of the raw hides (5 per cent) and raw skins (9 per cent). The major part (59 per cent) of the raw hides were exported to enemy countries (Germany 35 per cent, Austria-Hungary 21 per cent), while about three-fourths (76 per cent) of the raw skins were exported to the United States. The tanned and dressed hides and skins are classed in the Indian trade returns as leather, and though this leather is not a finished product, the tanned being only partial, especially in the case of hides, a higher value naturally attached to the manufactured or partially manufactured article than to the raw product. In 1913-14, tanned hides and skins formed by weight (304,621 cwt.) only 16 per cent of the total exports of hides and skins from India, but by value (£2,817,166) they formed 27 per cent of the total. To sum up, the United Kingdom before controlled the trade in tanned hides and skins from India, but had little share in the trade in raw hides and skins, which was much the more important of the two, both as to quantity and total value.

The trade with enemy countries before the war was mainly in raw Indian cow-hides (kips). These were by far the largest item in the exports of hides and skins from India. In 1913-14 the exports of raw kips amounted to nearly 750,000 cwt. valued at nearly £4,000,000, or nearly two-fifths, both by weight and by value, of the total exports of hides and skins, raw and tanned. Over two-thirds of these kips went to enemy countries, principally Germany and Austria-Hungary. The war has directed particular attention to this trade, and that not merely because of the difficulty of finding new buyers for the large quantities of kips suddenly shut off from their regular market. When converted into finished leather, kips are very suitable for use in making the uppers of stout boots, and they have been largely employed in Germany and Austria in the manufacture of army boots. At one time they were largely exported to the United Kingdom, but in the last two or three decades before the war the trade had passed into German hands. In India itself the merchant side of the business was controlled by German or quasi-German firms, who constituted a strong "ring."

STATEMENT SHOWING NUMBER OF PIECES PER BALE *

Arsenicated and Salted Cowhides

Hides up to 2 lb. weight...	500	piècés per bale
Hides over 2 lb. and up to 3½ lb.	300	
3½	250	
4½	200	
6½	175	
7½	150	
9	125	
12	100	
18 and above	90	

* Enforced from 15th April, 1920.

Arsenicated Buffaloes

Same as cowhides except for the following weights:—

18/22 lbs.	60 pieces per bale
23/35 "	50
26/30 "	40

Salted Buffaloes

Same as cowhides except for the following weights:—

20/25 lbs.	60 pieces per bale
25/30 "	50
30/35 "	40
35 and above..	30

Amritsar Goatskins

Amritsar is the great Punjab centre for the goat and sheep skin trade. Skins are sent from Peshawar, Jullundur, Multan, Delhi, Gujranwala, Jasur, etc., and their vicinities. They are collected in the various districts by *beparis*, who send them to Amritsar to be sold in the market on commission by their *arathdars* or dealers. Upon receipt of the skins into the purchaser's godown (storehouse), they are assorted into the following grades: Primes, Seconds, Rejections, Kids, Bulls. A new selection is made of the Primes and Seconds according to their weight: 1,000 pounds, 1,100 pounds, and 1,200 pounds per 500 pieces. The skins are pressed into bales of about 500 pieces, Primes and Seconds separately, and generally shipments contain 85 per cent Primes and 15 per cent Seconds, whilst the Rejections are sold locally. The purchase is made before the skins are assorted, and consequently considerable experience and good judgment is necessary to know what assortment each mixed bundle contains.

Marks

1,000 pcs. AGS..	{ 85% Primes
	{ 15% Seconds
1,100 pcs AGS..	{ 85% Primes
	{ 15% Seconds
1,200 pcs. AGS..	{ 85% Primes
	{ 15% Seconds

APPENDIX V**The Tata Iron and Steel Works**

The works are situated at Sakchi, adjoining the Kalimati station on the Bengal-Nagpur railway. Kalimati is 155 miles west of Calcutta, about 115 miles from the Jherria coal mines, and 45 miles from the company's Gurumaishini iron ore mines.

The Tata Iron and Steel Company, Limited, was formed in 1907, and the original plant was put into operation early in 1912. The plant consists of the following: coke ovens, sulphuric acid plant, blast furnaces, steel works, 40-inch blooming mill, 28-inch rolling mill, one 16-inch and two 16-inch bar mills, boiler plant, power house, iron foundry, machine shop, blacksmith shop, pattern shop, storage yard, locomotive shed and general main stores, office buildings, etc. Extensions to the existing plant are being carried out on a large scale and comprise: by-product coke ovens, by-product recovery plant and benzol plant, new blast furnaces, steel works, new blooming mill, new rail mill, plate mill, sheet mill, new bar mill, sheet bar and billet mill, wire mill, bolt and nut shop, sleeper press, additional machine shop, foundries and structural shops, new office building, etc. Details of the extensions are given under the respective headings.

COKE OVENS

There are 180 *Coppee* non-recovery coke ovens. The company has also recently installed a battery of 50 Koppers by-product coke ovens which, besides manufacturing coke, give the following by-products, coal tar, sulphate of ammonia, and gas. The company has also a Simon Carve sulphuric acid plant, which makes sulphuric acid for the purpose of converting the ammoniacal liquor into sulphate of ammonia.

Four batteries of 50 ovens each of the Wilputte type will be required in connection with the extensions to the works. This will make an additional 200 by-product ovens which will be complete with a plant for the recovery of coal tar, sulphate of ammonia, gas and benzol. In all probability it will be necessary to erect a fifth battery of by-product coke ovens in order to obtain the necessary coke required for the extensions to the blast furnace plant.

BLAST FURNACES

The blast furnace plant consists of two blast furnaces equipped with up-to-date charging and weighing apparatus and four Cowper-Kennedy stoves. The major portion of iron made is sent to the steel works for conversion into steel, and the balance is sold in normal times in India and abroad. Before the prohibition of pig-iron export from India came into force, shipments varying in size used to be made to Burma, the Straits Settlements, Ceylon, Java, Manchuria, China, Japan, Australia, New Zealand, the United States, River Plate, etc.

A third blast furnace of a somewhat smaller type than the two foregoing furnaces was completed and put in operation in August, 1919. In addition, two blast furnaces of a much larger type than those now working are in course of construction.

STEEL WORKS

The steel works plant consists of one 300-ton furnace, called the mixer, and six stationary open hearth furnaces, four of which are of about 50 tons' capacity per heat and two of 70 tons' capacity per heat. The liquid pig iron is conveyed from the blast furnaces to the steel works in 30-ton brick-lined ladles and poured into the mixer, which receives all the hot metal from the blast furnaces preparatory to its conversion into steel. From the mixer the iron is tapped out into ladles and charged into open hearth furnaces for conversion into steel. When the process of conversion is over, which takes on an average about eight to ten hours, the liquid steel is tapped and then cast into "ingots" which are sent on to soaking pits to be ready for the blooming mill. (Each heat produces about twenty ingots and each furnace makes on an average 13 heats per week.)

Extensions to the steel works consist of 25-ton Bessemer convertors and one 200-ton tilting furnace, together with a 1,200-ton mixer. The method of producing steel in these convertors is known as a duplex process, which consists of employing the Bessemer convertor in conjunction with the tilting open-hearth furnace. The convertors are intended to remove all silicon and as much carbon as is desired from the iron, leaving the tilting furnace the duty of removing the phosphorus and sulphur and bringing the iron to the required percentage of carbon. The elimination of these elements reduces the time necessary to finish a heat in the tilting furnace by about 75 per cent. The larger type of mixer will be necessary in order to take care of the hot metal from the blast furnace during the week end, when the open-hearth furnaces are not working. It is intended to convert the present 300-ton mixer into an additional open-hearth furnace after the 1,200-ton mixer has been erected.

There are at present four soaking pits which are placed in the steel works building. The soaking pits are equipped with mechanically operated lids and an electric overhead charging and drawing crane. The ingots made are 21 by 19 inches, and weigh from 2 to 3 tons each, according to the sections to be made from them. They are taken by a self-tipping electric trolley to the mill tables.

ROLLING MILLS

The blooming mill consists of a 40-inch mill operated by a Galloway engine of 11,000 horse-power. In this mill the ingot from the soaking pit is made into blooms and billets. In connection with the extensions a new blooming mill, details of which are not yet ready, will be erected in order to roll the increased tonnage of ingots into blooms and billets.

28-INCH FINISHING MILLS

The 28-inch finishing mill has three sets of rolls. The housings are of the open-top type and are held down by four bolts. This mill is operated by a 1,200 horse-power three-cylinder engine and can turn out rails from 100 pounds to 30 pounds, beams from 15 by 6 inches down to 5 by 3 inches, angles from 6 by 6 inches to 3 by 3 inches, and channels from 12 by 4 inches to 6 by 3 inches.

Blooms from the blooming mill are re-heated in re-heating furnaces before they are rolled. Sections of rails or structural material, after being rolled to required dimensions, are cut by circular saws into required lengths and are mechanically conveyed by rollers to a cooling bed, which is of the moving type. From the cooling beds all bars, including rails, are passed through a roller straightening machine in the finishing department, which is equipped with three straightening machines and the usual drilling and planing machines, and an overhead electric crane which runs over the full length of the finishing department.

A new rail mill is to be erected having a larger capacity than the existing 28-inch mill. When this rail mill comes into operation, the 28-inch mill will then be confined to rolling structural material, and all rails will be rolled on the new rail mill.

BAR MILLS

At first there was one 16-inch mill and one 10-inch mill. In September, 1915, one more 10-inch mill was added, so that now there are two 10-inch mills. The 16-inch mill makes light rails weighing 30 pounds to 14 pounds to the yard, angles of all sizes from 3 inches to 1½ inches, and channels from 4 inches down to 1½ inches, 4 by 1½-inch beams, and fishplates for rails. The 10-inch mills are devoted to the production of lighter sizes of flats, squares, rounds, etc.

It is proposed to erect a new bar mill which will be of the latest continuous type and will take billets from the sheet bar and billet mill varying from 1½ inches to 3 inches square in lengths of 30 feet. In this mill the piece being rolled will be in several sets of rolls at the same time, and the vertical rolls which will be used in the mill bring about extreme accuracy in the sections.

PLATE MILL

A plate mill is now in course of construction and will produce plates from ½ inch to 1½ inches thick in various widths up to 84 inches and various lengths up to 50 feet, both length and width being dependent upon the thickness. The mill will be driven by a continuous 2,000 horse-power motor taking alternating current at 3,000 volts. After the piece is rolled to the required thickness, it is carried off the back mill table to a table which delivers the plate to a straightening machine and then to a special table of light construction, where the plate will be allowed to cool and be marked to the dimensions to which it is to be sheared. The mill building is over 1,000 feet long and about 100 feet in width at its widest point.

SHEET BAR AND BILLET MILL

This mill will be in continuation of the new blooming mill and will roll billets from 1½ inch to 5 inches square for the bar mill, and will also roll sheet bars for use in the sheet mill up to 8 inches wide. It is intended also to roll steel sleeper sections up to 14 inches wide on this mill. An electrical drive for this mill is being planned.

SHEET MILL

The sheet bars will be delivered from the continuous sheet bar and billet mill to the sheet mill, where six special furnaces will reheat the bars. In one end of the furnaces the sheet bars are heated, and at the other end the partially rolled product will be reheated for finishing.

The rolling equipment consists of two jump rolls, two balanced rolls, six finishing mills, and two cold rolling mills. All the mills will be driven by a 4,000-horsepower motor taking alternating current at 3,000 volts. This mill will produce sheets to any width up to 38 inches, and of any thickness desired from one-eighth inch down to one-hundredth of an inch. Two large annealing furnaces will be supplied in connection with this mill.

BOLTS AND NUTS

In the scheme of extensions it is proposed to erect a bolt and nut shop with a sufficient number of machines to produce 50 tons per week.

STEEL SLEEPER PRESS

The steel plate from which the sleeper is to be made will be rolled direct from the ingot to the final plate without reheating. This will be accomplished on the blooming mill and sheet bar and billet mill. The plates will be cut by the flying shear of the sheet bar and billet mill in two or three length pieces and automatically placed on cooling beds at the end of the mill. From there they will be handled by an overhead electric crane to a heating furnace where the plates, after being heated, will be formed into steel sleepers by a hydraulic press.

ROLL TURNING SHOP

A new roll turning shop is being erected and additional lathes are being secured in order to turn the rolls required by the company in its existing and proposed mills.

LABORATORY

A well-equipped chemical and physical laboratory is attached to the works for testing the raw material and finished products. There is also a Government laboratory in charge of a Government official who tests the steel made by us, for which a Government certificate is required.

MACHINE SHOPS: STRUCTURAL SHOPS, ETC.

In addition to the old machine shop, a new shop containing up-to-date machines has been completed and is producing material required for the construction of extensions to the plant. There are also other shops for pattern-makers and carpenters, blacksmiths, locomotive repairs, electrical repairs, and structural shops.

POWER HOUSE

The power house contains four turbo blowers for supplying air to the furnaces in the blast house. A volume of 32,000 cubic feet of air, under pressure of 15.5 pounds to the square inch, is blown into these receptacles in the course of a minute, and the power absorbed is for a full load of 2,250 horse-power, for a three-quarter load 1,920 horse-power, and for a half load 1,700 horse-power. The plant consists of two 1,000-kilowatt, one 1,500-kilowatt, and one 5,000-kilowatt 3,000-volt turbo alternators running at a speed of 3,000 revolutions per minute and transformers of 1,250 K.V.A. 3,000 volts to 440 volts, two motor generator sets of 500 kilowatt each, and one motor generator set of 750 kilowatt. The additional machinery required for generating power for the extensions to the plant will be erected in a new power house building. The boiler pressure of the plant is 155 pounds per square inch.

WATER SUPPLY

The supply of water, not only for the works but also for the large number of persons living in the adjoining township, which has come into existence since the commencement of the works, was at the outset a question of supreme importance to the directors, but ample provision has been made for all purposes by pumping from the Subernarekha river—a distance of two miles. The water is pumped electrically through pipes 36 inches in diameter from the river to a very large storage tank at the works.

SUBSIDIARY INDUSTRIES

Arising from the scheme of extensions with the greatly increased product of the steel works, arrangements have in some cases been almost concluded, and in others negotiations are proceeding, for the establishment of various manufacturing companies in the neighbourhood of Sakehi, in order to take advantage of the close proximity of the steel works from which the raw materials required will be furnished. The following is a list of the various manufactures it is intended to produce: steel tubes and pipes; tinplate; enamelware of various descriptions; railway wagons; spelter; wire shapes of various kinds, including fencing wire, nails, etc.; agricultural tools; galvanized products; jute mill machinery; structural work; iron and steel castings; heavy chemicals; sulphuric acid; nitric acid; fertilizers; explosives; drugs; perfumes, etc.

SOCIAL WELFARE WORK

The Tata Iron and Steel Company started operation only in 1912, and though up to now the main efforts of the company were directed to overcoming the initial difficulties common to a new steel plant and getting up an efficient organization, the intellectual and physical well-being of the employees were attended to as far as the circumstances could permit. But now that the company has been established on a firmer footing, various important welfare schemes have been engaging the mind of the board of directors and the management. Below will be found a summary of the existing institutions at Sakehi for the well-being of its employees and the proposed welfare schemes now under active consideration.

There is a hospital where the company's employees and outsiders are treated free of charge. This hospital is taken advantage of not only by the employees of the company, but also by the inhabitants of some twenty to twenty-five villages situated within the radius of four to five miles of the hospital. It has been calculated that the number of patients is drawn from a total population of approximately 150,000 souls. As the accommodation at the present hospital is not sufficient to cope with the increasing number of patients, arrangements have been made for building a new well-equipped hospital on modern lines.

In connection with the present hospital there is a segregation shed, situated at a distance from residential quarters, where patients suffering from infectious diseases are kept. There is also a convalescence fund from the interest of which poor employees, who have no money to support themselves during the period of convalescence, are helped. As the want of a convalescent home for the employees is very much felt, arrangements are being made to have one built on the top of the neighbouring hill.

There are a number of schools at present at Jamshedpur: Mrs. Perin Memorial school; a girls' school; a night school; a mechanic school; and fifteen other primary schools.

The Mrs. Perin Memorial school is a high school. The accommodation has been found insufficient to take care of the increasing number of scholars and an annex has been built; further buildings are under contemplation.

In the night school, *chokras* and other employees of the company who are desirous of learning English and mathematics, get free tuition every evening for two hours. The number of employees attending the night school is about 65 at present. A shorthand and typewriting school has also been opened at Jamshedpur.

In the mechanics' school, promising young boys of the *mistri* class employed at the works are taught elementary mathematics and drawing with a view to make them more efficient.

It has also been proposed by the Government of Bihar and Orissa, with the help of this company, to start a technological college at Sakchi which would specialize in metallurgy and electrical and mechanical engineering, and this proposal is at present under discussion between this company and the local government. Co-operative credit societies have already been instituted.

The company has also built a fine institute for its employees containing a concert hall, a restaurant, billiard and reading rooms, tennis courts, cricket and football grounds. Any employee can become a member of this institute without distinction of pay, colour or creed. For the convenience of employees living in G Town, the company has built a branch institute in that quarter.

It is intended to erect a bank building in the near future which will be a branch of the Tata Industrial Bank, Ltd. Agricultural and dairy farms on up-to-date principles have been started in order that the inhabitants may obtain fresh supplies and dairy produce. In connection with the agricultural farms, experiments are being carried out with a view to establishing an activated sludge plant to supply fertilizing material for the farms.

This company, realizing the harmful effects of long hours on workmen, has introduced in all its operative departments, coke ovens, blast furnaces, steel works, rolling mills, etc., a shift of eight hours instead of one of twelve hours, which is the usual practice in Indian factories.

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